AMERICAN GAS ASSOCIATION MONTHLY

Vol. VI No. 9

SEPTEMBER, 1924

Sixth Annual Convention Atlantic City

October 13-17, 1924

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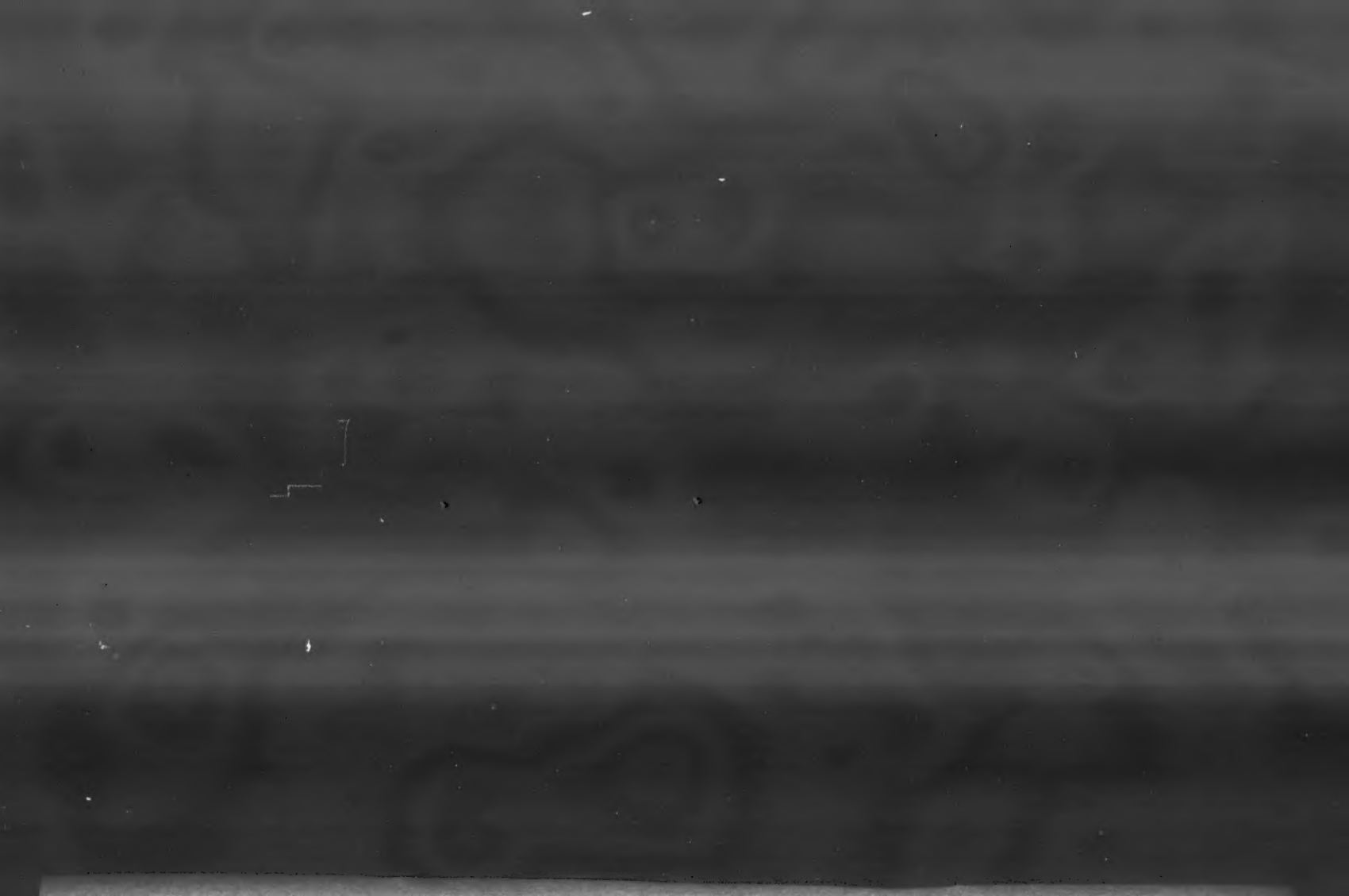

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FOR STATEMENTS AND OPINIONS CONTAINED IN PAPERS AND DISCUSSIONS APPEARING HEREIN, THE ASSOCIATION DOES NOT HOLD ITSELF RESPONSIBLE

AMERICAN GAS ASSOCIATION MONTHLY

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American Gas Association Monthly

Vol. VI SEPTEMBER, 1924 No. 9

Will You Grasp the Opportunity?

At the close of the 1923 Convention and Exhibition we believed that it had been a success and that everyone who attended had received some benefit. And our judgment was proven to be correct from the letters received at headquarters. Some of them said:

> "I was keenly interested in the Atlantic City Convention. It was a splendid convention in every way so far as I was able to judge, and I received a good deal of helpful information."

> "My hearty congratulations upon the great success of the 1923 Convention. It was far way ahead of any convention which has previously been held, and I have returned home full of enthusiasm for the future of the industry."

> "I wish to take this opportunity of stating further that the show just closed was one of the most satisfactory from every standpoint that we have ever had....."

And there were many others.

Now this, the Sixth Annual Convention and Exhibition, promises to be bigger and more interesting in every way than any of the predecessors.

Are you going to do your part?

Are you going to attend and absorb the benefits that will be waiting for you there in the various meetings?

Are you going to see the exhibition and thoroughly acquaint yourself with the latest developments in appliances, apparatus and accessories?

Are you going to mingle with your fellow workers and broaden your knowledge by mutual exchange of ideas and problems?

In short, are you going to grasp the opportunity which the coming Convention presents and return to your work a bigger, better and more enthusiastic worker?

AMERICAN GAS ASSOCIATION MONTHLY

Vol. VI SEPTEMBER, 1924 No. 9

An Exclusive Interview with John Moody*

John Moody

WHEN YOU WANT a definition, you go to the dictionary; when you want heat you call in the gas man; and when you want ratings on your stocks and bonds you go to the big rating volumes of Mr. John Moody. When Mr. Moody, whom hundreds of thousands of investors regard as an authority and guide post of finance, takes a stand on any particular development of industrial and financial conditions, the careful investor listens with both ears at attention.

In the great open spaces of his private office, easily four times the size of the average executive offices, Mr. Moody recently stated, in an exclusive interview with a representative of the American Gas Association, that in his estimation gas and electric company securities had earned the right to the same general rating as a class that was formerly given to railroad stocks and bonds. He recognized the growing possibilities in the public utility field years ago, he said, and the intervening time has only served to confirm his judgment.

Coming at this particular time, such a statement from Mr. Moody is of outstanding significance. Since the first of the year gas securities have enjoyed a popularity in the big speculative markets which is unprecedented. This is not a "boom," according to the financial press of the country, but merely the harvest of many years of proven stability and safety. The New York *Times* says that the rise is due to nothing more than the "natural result of expansion and improvement of service."

Under the headline "Gas Stocks Come into Public Favor," the *Wall Street Journal* notes that four out of six leading listed issues have reached new high levels for the year on the Exchange.

*Reprints of this paper may be obtained from Association Headquarters in pamphlet form at cost of printing in any quantity.

"While the immediate causes are believed to be the favorable yields from stable companies during present low money rates and the general popularity of public utility securities," says this paper, "there is added significance in the general advance of gas company stocks.

"Leaders in the gas industry are of the opinion that the next few years will witness an advance in the utilization of gas by large industries which will result in consumption of both natural and manufactured gas moving forward at a rate which will be comparable to the expansion in use of electric power over the last decade.

"While gas consumption has been showing constant gains, performances of big companies in Chicago and New York in recent years have indicated the remarkable extent to which use of gas as a fuel can be expanded."

The American Gas Association recently pointed out that one of America's largest bakeries uses as much gas every day as would be consumed in five hundred average homes. One of a series of monster gas burners, recently installed in a great steel plant, alone burns not less than 16,000 times as much gas as the burner on a kitchen range. As the helpmate of industry gas has a future which gas men themselves are only just beginning to appreciate.

Wall Street and the Public Wake Up

Mr. Moody thinks the investing public should have been aware of this situation at least four or five years ago. He agrees with the opinion that the upward movement in gas company securities is due, not to any startling change in the industry, but to a healthy, normal growth under demand. The real change lies in the awakening of Wall Street. The best of gas company stocks and bonds have been a prime investment for a considerable time.

"Now," said Mr. Moody, "the public are beginning to appreciate what they have been missing all these years. A Wall Street interest has been aroused. Here in this office we are receiving an increasing number of inquiries from investors who were never known to have an interest in this class of securities before.

"The real switch in favor of gas as well as electric company securities has come about since the war. I am speaking, of course, from the investor's point of view. During the past five years, the business of these utilities has increased in a way that, I am safe in saying, is not comparable in any other industry. Even during the depression of 1920-1921 gas company earnings maintained their position with a remarkable degree of stability. This was a decisive test which for the first time attracted the capital of both speculative and investment groups.

"Investors as a rule cling to their prejudices, and very frequently these are the same prejudices that their grandfathers had. Before the war gas companies were principally small, local affairs, whereas railroads, the favorite investment of the past few generations, were nation wide in scope. They were the backbone of most family incomes for scores of years to the exclusion of nearly everything else. Investors of this class still clung to railroad bonds even when some of the biggest lines in the country were losing money. These bonds still sell higher than public utility bonds because they have the advantage of well entrenched support.

Gas Securities are Still Somewhat of a Novelty to the Public

"Of course, I realize that the gas industry is by no means a new one; but

the securities of gas companies are still more or less of a novelty to the investing public. Until recently many people felt that gas securities had not been on the market long enough to pass the test of time or experience. Now that the testing period is over, the tide is changing very rapidly in the other direction.

"Public utilities are not the only class of securities that have faced and surmounted the prejudices of the public. Educating the investor to buy foreign bonds, and even the best industrial issues, was a slow, laborious process. Twenty-five years ago the old fashioned type of investor would rather have bought the bonds of an indifferent railroad which he knew nothing or little about than to have 'speculated' in an upstart like U. S. Steel 5 per cents. Well, from his own lights he was correct. The permanency of the latter had not yet been established.

"Since then the public has seen the holders of both railroad and industrial securities suffer severely during periods of depression, especially in 1921. Railroads were knocked endwise, and industrials were affected in a variety of ways. Even today many industrials are facing an uncertain period in which it is possible we may have to take a good deal of our payment from European debtor countries in the form of goods from French and Belgian textile mills and from French and German steel mills. Of course, this is only part of the picture. There are many favorable factors which will probably offset these contingencies. It still remains that the industrial prospect is a bit uncertain.

Unaffected by Depression

"Not so with the gas and electric utilities. During the depression, gas and electric securities not only held their own, but in not a few cases actually advanced. They have come to be regarded as securities of essential industries that have successfully gone through the mill; that have been with us long enough and whose record is well enough known to have achieved a reputation for permanency. It may be said that I, personally, became a stronger advocate of gas and electric securities when I saw the stabilized condition of these industries at the time when everything else was going to pot.

"But these are not the only reasons for the increasing popularity of public utility stocks and bonds. There have been strengthening causes within the industry itself. Rate making, which has a direct effect on the value of gas company securities, has become more of a science and less of an approximation; less of a political matter and more of a judical one. In most cases, under public service regulation, fair rates can be demonstrated to the satisfaction of all parties concerned. The famous Cleveland fight and similar destructive rate battles could scarcely be repeated today.

"Intelligent and impartial regulation of public service companies under the commission system has engendered confidence in gas and electric securities. Watered stocks, inflation of funded indebtedness and similar abuses are virtually impossible under the present form of regulation. For that matter, the average gas company management saw long ago that profits in this field were made only by producing goods in the form of service.

Franchise System Handicaps

"The most serious problem the public utilities have had to deal with has been the matter of franchises. The tendency now is to get away from franchise restrictions, and I understand that a number of states have solved the problem by the adoption of what is known as an

indeterminate permit, which protects both the investor and the consumer. I believe this is a healthy development.

"The defects of the franchise system were first realized when, almost over night, with the sensational rise in commodity prices during and immediately after the war, the possession of a franchise became a liability instead of an asset. You could capitalize a franchise twenty years ago. Generally the franchise was actually far more valuable than rolling stock, or plant equipment. But, as it happened, there was no provision in those old franchises for a revision of rates when raw materials and labor skyrocketed to unprecedented figures. A franchise became about as valuable as a mill stone around the neck. This was especially felt by the traction group, and, as the tendency has been until recently to lump all forms of public services into one group, both gas and electric utilities shared the unpopularity of tractions. Fortunately the tendency now is to differentiate between the various classes of public utilities, and this should have a beneficial effect on gas securities.

Discrimination Absurd

"Thus the financing end of the gas industry has also gone through the mill. In my opinion any discrimination against public service securities as a class is nothing less than an absurdity, based upon ignorance. Nevertheless, many states, New York included, in regulating the investments of savings banks, trust funds, insurance companies, etc., still discriminate against gas and electric stocks and bonds, while they legalize investment in some other securities to which I wouldn't even give house room. Railroad securities are permitted so long as they satisfy other requirements of the law; but where in some states the law may be interpreted to include trolley lines, some of these institutions frequently stretch a point by buying utility bonds backed by the additional security of a traction line.

"Once these legal barriers are raised in favor of the utilities, not only will the market for utility securities be broadened, but financing will also be less costly. In other words, interest rates will come down and the gas company will have more opportunity of extending its services and rendering them more economically.

Customer Ownership

"Customer ownership is beginning to accomplish this already to some extent. In spite of the success of this method of financing, however, I do not think it is possible or even desirable for a public service company to do all its own financing. After all, an open market in which the investment banker remains the adviser and financier is the best way for the investor, especially the small investor, to establish the actual value of his commitments.

"As a general rule, too, I do not think it is wise to sell common stocks in a customer ownership campaign. It is true that common stock is the healthiest form of financing. Bond financing is the capital source of an infant industry. Only strong companies can finance themselves successfully with junior securities. The fact that companies are expanding more and more through the sale of common stocks is an encouraging sign and is good evidence that they are in a very favorable position. On the other hand, the purchaser of common stocks is too often a speculator. He expects too much for his money. He is willing to take a risk. The customer owner is not a speculator. He has confidence in the company and in its securities. Therefore the company should take no chance of weaken-

ing his confidence, even through causes beyond its control.

Influence of Holding Companies

"Another fact which has improved the position of gas company securities is the comparatively recent development of holding companies. A holding company is an organization formed to acquire, combine and operate related properties. Largely as the result of this fact, the public utility industry today is about what the railroad industry was in 1900. Public service as we know it is a nation-wide business. While the holding company idea may have certain disadvantages, it seems to me that the advantages far outweigh them. If it had accomplished nothing else, it is sufficient that the holding company has made a world-wide market for the securities of its subsidiary properties. As a banker would say, it has made them liquid; that is, marketable. This is a fundamental improvement over the restricted, private markets of purely local management in times past.

"These two tendencies, customer ownership and holding company financing, by bringing the public in as shareholders of the industries which supply them with the services of light, heat and power, have stimulated a healthy popular interest in the causes behind the prosperity or otherwise of the local public service company. Never before have the people demanded as much information about their local utilities as they do today. They are avidly curious about every angle of the business. They are tired to death of the rantings of catch-penny politicians. Above everything else, they want facts.

"It seems to me that the gas industry has an unrivalled opportunity here to establish public confidence and extend its services. Advertising is just as important in the gas business as it is in any other business. In some respects more so, because the public gets just as much benefit from the public relations work done by the gas company as the gas company does itself. Public utility advertising should be encouraged as much as possible. While doing so, it should be remembered that 'progressive managements spend money constructively.' "

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A Mid-West gas company writes:

"We certainly appreciate the advantages the American Gas Association offers a small company like ours and we believe that our membership in the A. G. A. is about the best investment we can make."

Gas Engineering Chair at Johns Hopkins Filled

THE JOHNS HOPKINS University has just announced the appointment as Professor of Gas Engineering of Dr. Wilbert J. Huff, lately of the Koppers Company, Pittsburgh. Dr. Huff will assume the duties of his new position on September 1st, 1924, and will have charge of the instruction and organization of the new courses in Gas Engineering at Johns Hopkins University.

Dr. Huff was born at Butler, Pennsylvania, on October 4th, 1890. He is an honor graduate of Yale College, class of 1914, and received the rating of Philosophical Oration, which is the highest honor awarded. He also received special honors in Chemistry. He took the degree of Doctor of Philosophy at Yale in 1917. While a graduate student at Yale he was Henry Bradford Loomis Fellow, a high honor, and during this period he engaged in teaching.

Since 1917 Dr. Huff has been engaged in chemical and engineering research with the Barrett Company, the United States Bureau of Mines, and the Koppers Company. He was a lieutenant in the Chemical Warfare Service in command of the Princeton research detachment. Since 1920 he has been with the Koppers Company in charge of the research division of the Koppers Company Laboratories. He has had under his direction a number of men engaged in various research problems connected with the by-product coke and gas industry, some in the laboratory, others in the field. This work has taken him over a wide section of the country and into all phases of the gas industry.

In extending the invitation to Dr. Huff the University acted only after very careful consideration of a large number of men who had been suggested as suitable for the new Chair, and after consultation with many experienced and influential men in the gas industry. The University feels that it has not only selected the best available man, but one having conspicuous qualifications in the fields of engineering practice, education and research. During the past year Dr. Huff has been to Baltimore several times, has conferred with the University authorities, has aided them in their deliberations, and has shown a vision and enthusiasm for the opportunities open in this new departure of the establishment of a Chair of Gas Engineering.

Quoting from a recent letter from the University:

"The new courses will offer special opportunities to men of the following types:

1. "Men who have already been engaged in the gas industry, who already have a certain technical knowledge, and who desire to perfect themselves professionally for positions of wider responsibility.

2. "Technical employees of existing gas companies of various types for whom advanced scientific training or investigation and research is desired. Companies having special problems for solution will do well to send a representative to the University for study and prosecution of such problems.

3. "Promising young men with no technical training, but who desire to enter a regular four years' undergraduate college course, leading to a degree in Gas Engineering. All such young men should be graduates of approved high schools.

4. "Promising young men, sons of employees of gas companies. Young men of this type are being assisted by an increasing number of companies in other fields of industry throughout the country as a part of a general plan for rewarding

faithful services, and for improving the future personnel of the body of employees.

"Speaking generally the new course in Gas Engineering offers opportunities for drawing into the gas industry an increasing number of young men with wider technical and professional training. These young men would normally enter the undergraduate school, for entrance to which a high school training would be necessary. Further, the new course will offer opportunities for men who have already had technical training, to enter graduate work, looking to training for research and advanced degrees.

"We feel positive that the expansion of the gas industry for the future will be largely dependent upon the thorough knowledge and ability of the men connected therewith, and the realization by them of the great many possibilities of gas and its application in all its various phases."

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F. J. T. Stewart

It is with regret that we announce the death of Mr. F. J. T. Stewart, Superintendent of the Bureau of Surveys, New York Board of Fire Underwriters and former President of the National Fire Protection Association.

Mr. Stewart's duties brought him into frequent contact with the American Gas Association and due to his outstanding ability and pleasing personality he had many admirers and friends among our membership.

As an authority in the preparation of underwriting codes and rules relating to fire prevention, he was at all times open to suggestions and his work reflects his strong desire to be reasonable and just to every industry.

The American Gas Association joins with the New York Board of Fire Underwriters and the National Fire Protection Association in deeply deploring the death of Mr. Stewart.

"Home is the corner-stone of our civilization"

Warren G. Harding

THE environment of your home is directly affected by the character of the service rendered by the equipment in the home.

Better Gas Appliances make Better Homes.

Permit your local dealer to show you the modern gas range so that you may have properly cooked foods; the automatic water heater, that you may have an abundance of hot water for the sake of cleanliness.

Gas Is Clean

—with proper burning it produces no smoke, soot or grease.

PACIFIC GAS AND ELECTRIC COMPANY

P·G·and E·

"PACIFIC SERVICE"

209-624

An effective Ad from the Coast

Municipal Ownership a Barrier to Progress

From an Article in the Boston Evening Transcript

PRIVATELY OWNED gas and electric companies are generally better equipped to give efficient service at reasonable cost than municipally operated plants, according to Deane W. Malott, Assistant Dean of the Harvard Business School.

"The welfare and prosperity of any community," he asserts, "are dependent upon the welfare and prosperity of the surrounding territory tributary to it," and he suggests that municipal ownership is a barrier to the complete development of this region.

"The potential field of service is larger for the privately owned company," says Mr. Malott, "inasmuch as municipal plants seldom extend their service beyond the city limits. Rural development is usually impossible under municipal ownership because communities as a rule are without authority to conduct any business or any activities outside of their corporate limits. Even when so authorized, taxpayers of a community do not relish bonding that community or paying taxes to meet payments on bonds for capital to be spent in giving service outside of the community."

While it is true that municipal securities, being tax-exempt, can usually be floated at lower interest rates, Mr. Malott reminds us that this advantage is only nominal.

"The issuance of municipal bonds is dependent upon the vote of the citizens. The management of municipal utility companies, therefore, are faced with the necessity of going before the people and convincing them of the necessity of spending the desired money. These contemplated outlays are often the subjects of prolonged discussions, usually with the violent opposition of a considerable part of the community. This opposition is directed toward keeping down the public outlays without much regard, either to the needs of the business enterprise, or to the ultimate public benefits.

"The privately owned corporation, on the other hand, is in a position to secure funds to develop its business as the community's need increases, without the consent of the taxpayers. The privately owned plant is sometimes willing to take a loss or make an investment in machinery for future expansion which the municipally owned plant may not always be in a position to do. Furthermore, in municipal operations, there is always competition between the various departments of municipal activity for the appropriations, and this competition rather than the absolute need determines the amount allowed for any particular function. Thus the advantage of more readily securing desired capital seems to lie with the private companies."

Again, although municipal plants are exempt from taxation, what the consumer gains in lower rates must be made up by higher taxes from other sources.

"In other words, the man who does not use gas or electricity helps pay other people's bills under municipal ownership.

"There are certain other dangers arising from political causes usually inherent in municipal ownership. Wages are likely to be determined by political rather than by economic considerations. Occasionally this results in too low a wage scale, but more often such a condition may be unfair to the public because of

the burden of unnecessarily high wages paid to municipal employees. Another result of political management is frequently found in the tendency toward needless and wasteful increases in the number of employees in the case of public utilities under municipal operation.

"The service of any plant depends in very large degree upon the ability and skill, the zeal and energy, and soundness of judgment of the human agents employed therein..... These requisites are more likely to be lacking in an organization created by political methods to perform an economic function, than in a company organized entirely for economic motives..... Too frequently municipal plants are operated by temporary and frequently changed managing officials with an imperfect knowledge of their duties and often without the training necessary to efficient management; frequent disorganization of the machinery results from these changes; and at the bottom there is a group of minor employees, without the opportunity for advancement which supplies the principal motive for zeal and energy.....

"Furthermore, the tendency in private companies is towards consolidation into large holding companies. This condition makes possible the employment of experts in the various technical and executive phases of operation, which is obviously out of the question in the small municipal plants. It is apparent, therefore, that the private company normally has a better opportunity for efficient management than the municipal plant.

"Utilities that are privately owned must regard the service they render as a business, subject to all the laws, regulations, and ethical standards of the business world, asking for it neither special privilege nor immunity from taxation. They, in good faith, invest their capital and assume the risks and hazards incident to such enterprises. They become as much a part of the community as any of its other enterprises.

"The function of government, municipal or any other, is to secure the rights, liberties, and happiness of the people from which it derives its power. The only justification for public ownership, then, is to render better service than can be rendered privately, or to render the same service at lower rates. To date the burden of proof lies with the municipal companies."

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IF there is a virtue in the world at which we should always aim, it is cheerfulness.

—Lytton

GENERAL

CHAIRMEN OF GENERAL COMMITTEES ORGANIZED TO DATE

Accident Prevention—F. W. Fisher, Rochester, N. Y.
Amendments to Constitution—Wm. J. Clark, Mt. Vernon, N. Y.
American Engineering Standards Committee, Representative on—A. H. Hall, Cambridge, Mass. —(Alternate Representative) W. J. Serrill, Philadelphia, Pa.
Award of Beal Medal—J. B. Klumpp, Philadelphia, Pa.
Chamber of Commerce—R. B. Brown, Milwaukee, Wis.
Cooperation with Educational Institutions—W. G. Gribbel, Philadelphia, Pa.
Customer Ownership—Chas. A. Munroe, Chicago, Ill.
Education of Gas Company Employees—B. J. Mullaney, Chicago, Ill.
Entertainment—Wm. J. Clark, Yonkers, N. Y.
Finance—James Lawrence, New York, N. Y.
Gas Code—W. R. Addicks, New York, N. Y.
Gas Standards and Service—R. B. Harper, Chicago, Ill.
National Fire Protection Association—R. S. Doull, New York, N. Y.
Nominating—H. A. Norton, Boston, Mass.
Rate Fundamentals—H. M. Brundage, New York, N. Y.
Representation on National Joint Committee of Public Utility Associations—D. D. Barnum, Boston, Mass.; R. B. Brown, Milwaukee, Wis.; H. L. Doherty, New York, N. Y.; A. Forward, New York, N. Y.; C. H. Gibbs, Philadelphia, Pa.; J. B. Klumpp, Philadelphia, Pa.; A. P. Lathrop, New York, N. Y.; Chas. A. Munroe, Chicago, Ill.; Wm. L. Ransom, New York, N. Y.
Simplified Practice—C. T. Aaron, Boston, Mass.
Standard Gas Appliance Specifications—W. T. Rasch, New York, N. Y.
United States National Committee of International Commission on Illumination, Representatives on—Howard Lyon, Gloucester, N. J.; E. H. Earnshaw, Newark, N. J.; G. G. Ramsdell, New York, N. Y.

Two Men Asphyxiated*

A Lesson for Gas and Electric Utility Employees Exposed to Gas in Manholes, Trenches, Boiler Rooms, etc.

The manhole cover on a drip tank for an 8-inch high pressure main in the gas plant yard was leaking and on Saturday, June 7th, the gate valves into the tank were closed and the by-pass valve opened. The cover was removed so that a new gasket could be fitted in the shop and the tank was left open over Sunday. On Monday, Frederick P—, a general plant mechanic, and his helper, Matthew M—, went out to the pit to put on the cover and the new gasket. There were no witnesses and the events must be surmised from the evidence found later. Apparently P— went down the permanent steel ladder into the concrete-lined pit leaving his helper stationed above to watch him. The pit was about ten feet wide, twelve feet long and twelve feet deep and was continuously ventilated through a three-foot by four-foot entrance in the roof. The place was not regarded as an especially dangerous one and it was not considered necessary to use a gas mask. A strong but harmless gas odor was naturally expected from the drip collected and it was probably almost impossible to detect the live gas escaping under the 30-pound pressure through leaks around some of the valve flanges and probably through the closed valves. P— had partly fastened the manhole cover in place when he collapsed. His helper started down the ladder but apparently he had formed the dangerous habit of descending inclined ladders frontwards. He had nearly reached the bottom when his foot slipped or his heel caught on a rung and he pitched forwards, striking his head on a valve and falling, stunned, into a corner with his feet upon the ladder and the tank.

*Reprinted from the Empire State Gas & Electric Association Bulletin.

The two men were not discovered for thirty or forty minutes. The prone pressure method of resuscitation was started as soon as they were removed and a mixture of oxygen and carbon dioxide was administered through an inhaler, as recommended by the American Gas Association Commission. The men, however, showed no signs of life when found and it was evident that respiration had been stopped for some time. The long-continued efforts of fellow employees and several physicians were unavailing. Autopsies showed that the blood of each of the men was nearly saturated with gas. The deep wound in M—'s forehead had not caused a fractured skull but it probably stunned him and the inhalation of the gas prevented him from regaining consciousness.

M—'s immediate attempt to rescue his companion was commendable as an act of courage, and it is one of the ironies of fate that this very act really contributed to the death of both. It would have taken less than a minute to secure additional assistance and if this had been done both men would have been saved. The natural impulse is always to do just what M— did, and in the excitement of an emergency men do not stop to think. For this reason, definite instructions must be issued so that men will automatically do the right thing as a matter of habit or routine instead of acting on impulse. Even after a man collapses from gas poisoning, the lapse of the first two or three minutes will not greatly reduce the possibility of resuscitation. *A man who sees another person collapse should first endeavor to secure someone—even a passerby—to watch while he attempts a rescue. Additional assistance can then be secured if it is needed.*

Many asphyxiations occur to old experienced men and are due to over-confidence. An atmosphere containing less than 2% of illuminating gas will produce dangerous and even fatal results. The toxic constituents in the gas are practically odorless and the odor of the impurities is a treacherous guide as to the amount of gas present. Men overestimate their power of resistance and too often have the idea "It'll only take a minute and I can last that long." Unfortunately the first warning that the limit has been reached comes when the man loses control of his limbs and it is then too late to escape.

Gas masks were available at the plant where this accident occurred but were not used. This is an ever present difficulty for a public utility company. The employees fail to appreciate the dangers and dislike the masks because of their clumsiness. Active and rigorous supervision is therefore necessary to establish safe habits of work. Gas masks should always be used where there is the slightest possibility of free gas in poorly ventilated spaces. Every effort should be made to establish this practice as a matter of routine. The best modern practice where men enter gas tanks, manholes and district governor pits is to make the use of masks and life belts compulsory.

The Baltimore Plan of Industrial Education

E. B. LUCE, Educational Director, Consolidated Gas, Electric Light and Power Co., Baltimore, Md.

E. B. Luce

THE CONSOLIDATED Gas, Electric Light and Power Company of Baltimore has recently established an Educational Department to put into effect an expanding educational program, as a fruition of activities carried on for a number of years.

The Consolidated Gas, Electric Light & Power Company is itself the basic factor in the system of education which will be carried on, but all educational facilities and agencies which are available in the community and elsewhere, namely, universities, public schools, private schools, libraries, current literature, correspondence schools, local and national organizations, prizes for individual effort, etc., which may be useful in promoting the work of the company, will be utilized. The plan is democratic, the belief being that education, to be effective, must be widespread in interest, responsibility, and effort; but it is directed by a central planning and cooperating department.

"The Baltimore Plan" is operated on the basis of supplying the *educational needs of industry and workers* and not on the basis of supplying the needs of educational institutions and students. Education is but a means to an end; the end is in industry or in other useful work, and the direct instrument to achieve it is the worker.

"The Baltimore Plan," many phases of which have been in operation for several years, provides for:

1. Summer employment of college and other students, through the exercise of careful, selective methods to insure ability and reliability. When students are in industry under this proposal, they will be *workers,* but this status in no way inhibits the learning process if the worker will use his legs, eyes, ears, tongue and note book.

2. Taking graduates of universities and secondary schools into apprenticeship courses and providing otherwise as may be desirable to train them into employment, in the technical, supervisory, and executive jobs.

3. The employment of professors and instructors who desire and need fresh contacts with industry in vacation time, who, during the scholastic year, instruct gas and electric employees, or those who are likely to become the com-

pany's employees. Various consulting, research, testing, supervisory, instructing, or special jobs, possibly in some cases operating jobs, will be suitable. Industry in many ways advances faster than education, and this exchange of instructors will help to break down the isolation and will extend the benefits derived by the instructors to large groups of students through the improved and practical quality of instruction. The exchange of instructors requires almost no disarrangement of routine. They are fitted in naturally where their special qualifications can be utilized and the needs of the industry served. They, like the students employed during vacation time, are employees, but on a higher level. The practice of supplying teachers for outside evening and special courses, speakers for special subjects, etc., is also encouraged, as are also observation and inspection trips by teachers, instructors, and students through the various branches of the industry.

4. Arranging with an instructor who has worked with a special group of employees during a summer period and become familiar with the problems confronting them—provided it is thought desirable to do so—to give an extension course to the group. In some cases this may be the purpose for bringing in the instructor in the first instance. If this is so, then the instructor can shape his work from the beginning to this end.

5. Continuing night courses, which are now so generally given throughout the country, for employed people. The outside course work in which the Consolidated Gas, Electric Light and Power Company of Baltimore shares in the expense with the employee, is an important part of the Baltimore Plan.

6. Help from the industry to educational institutions in supplying equipment, building up subject matter, and financing, especially when new courses are established.

7. Encouraging representatives of the educational department of the company whenever opportunity is offered, to cooperate actively in serving on committees of educational institutions, and also to render assistance in securing enrollments of students for night and special courses.

The Baltimore Plan of cooperative education applies not only to universities but to other educational institutions; not to employees interested only in engineering, but to any other group of workers that can profit by some phase of the plan. The control is always centered in the company, hence the utilization of the scheme can be fitted to the educational and training needs of the company.

8. Cash prizes to juveniles for the successful completion of approved courses in free public evening schools. Such bonuses will no doubt be given in the future to adults who desire and need an elementary education.

9. Group educational meetings along both departmental and vocational lines. One main purpose of these meetings is orientational, i.e., instruction and information for employees in relation to the organization of the company, functions and duties of departments, public relations, etc.

10. Encouraging suitably qualified employees to instruct in night classes.

11. Cooperation with employees in keeping in touch with current technical and business literature by a plan of joint expense subscriptions for selected magazines and a plan of circulation of such from the company's library to lists of employees.

12. Operating the company's library on a service rather than a reference basis for disseminating useful information in the form of books and pamphlets and in the form of papers prepared by employees on subjects related to the company's business.

13. The preparation and distribution of manuals of standardized procedure and original data pertaining to the work the company is doing.

14. Supervision of methods for following up and training *in* new employees.

"The Baltimore Plan of Industrial Education" is based upon certain definite priciples, which may be briefly stated as follows:

1. The work of *training employees into jobs* should be kept close to the jobs themselves. This principle applies to new

employees and to old employees promoted or transferred to new jobs. Such training should be done by the more experienced employees, who are carefully selected for the purpose. The superintendents are not generally suitable persons to conduct the training of employees as it requires specialized and individual work with employees, which conflicts with the supervisory functions of superintendents. This training should be done by persons who are directly connected with the departmental activities and operate as a part thereof; but such persons at all times will operate under the plans, instruction, supervision, and with the cooperation and help of the educational department.

2. Existing educational institutions are utilized to the utmost in preparing the prospective employee, prior to original selection, and subsequently to improve the worker. The company does not undertake educational work inside the company if it is possible to have it done outside by those whose business is education. If outside educational agencies are not meeting the needs of the company, every reasonable effort will be made *to strengthen them* before the company will undertake to do such work itself.

3. Any educational work done inside the company should be such only as is not and cannot be provided outside, or the necessity and desirability for it is so evident by virtue of the functions or policy of the company or the duties and responsibilities of the employees who are trained, that its establishment is justified.

4. Any educational work which cannot be done wholly by schools or wholly by the company, but can be done jointly, should be done through cooperative effort of the schools and the company. Educational work of this nature is illustrated by certain extension courses; by instruction of juveniles or foremen under the provisions of the Smith-Hughes Act, as a gas and electric company's class, if such should be considered desirable at some future time; also in the starting of new and needed courses in educational institutions which are closely related to the work of the company.

5. All educational and training work should keep the requirements of *the work* which the company exists to do foremost in all plans. The development and growth of employees comes out of this main purpose, and in them the company does and should have a genuine concern. The more intelligent the worker, the more efficient he will be and the better will he represent the company in his public contacts. But the *work to be done is first* in order. Employees are *first workers* and *second learners: they are employed to work.* Any training given is for the purpose of better accomplishing the work of the company. It is fortunate that in this process the worker is improved and started on the road of progress.

6. Any training or education necessary for the satisfactory performance of present as contrasted with prospective duties and responsibilities may well be given on company time; other education and training should be on the employee's time or on a cooperative basis; e.g. training into jobs and essential orientation work should be given on company time, also some organized class work within the company; inspection trips which are desirable but not essential should be on the employee's time.

7. Training and educational work should be laid out and systematized as carefully as other work of the company. So far as possible, *plans and programs should be made objective, thus opening the way to improvements. The necessary organization should be provided to study the training problems of the various departments and to coordinate the effort.* This educational service organization should have centralized control and extend through the selection of responsible department representatives to every part of the organization.

8. The stimulation of individual effort of employees through advisement and through rewards and prizes, is effective and desirable.

9. Present training facilities of the company should be expanded to the limits of usefulness in the lines they can serve before others are established.

10. The group method should be used for economy and effectiveness so far as

possible, supplemented by work with individuals. Training into jobs must be largely individual.

A Fundamental Conception

The underlying philosophy of the Baltimore Plan, is that while an individual is passing through his most formative years, i.e., while he is in the school period of life, his major effort is in education and his minor effort is or should be in some useful work. When a person leaves school to enter employment, his major effort is *transferred from education to occupation,* while his minor effort should still be education, if he is to be a developing individual. The more suitable and thorough one's education before entering employment, the higher will he be likely to start in the occupational scale and the more rapid will his progress be. But however high an individual may start in any occupation by virtue of thorough preparation, he cannot start at the top but *must start far down the line.* To get to the top, he must *"grow up"* to it through experience and reflection, driven by the motive power of his interest. In other words, the student of whatever grade must be "broken in" and at no time will he cease to be a student if he is to grow and develop. *The educational effort must, therefore, continue hand in thought and thought in hand simultaneously with one's occupation.*

Sources of Educational Help

There are, in the main, four educational sources to draw upon for help in promoting the progress of the company and in stimulating the development of its employees:

1. The company itself, i.e., its plants, its equipment, its problems, its processes, its contacts, its leaders, etc.
2. Other companies and utilities meeting the same or related problems. The experience of these companies in other cities will lead them forward along different lines. The interchange of advanced thought and practice is most helpful.
3. Educational institutions, in giving preparatory training and subsequently in supplementary and cooperative ways.
4. Books, or the printed page in whatever form it may take, whether books themselves, magazines, house organs, manuals or mimeographed sheets.

The above sources are listed in the order of importance. *Experience* and the dealing with *things themselves* are our best educators. The company itself, therefore, comes first as the foremost educational agency for its employees. It may be conceived of as a great experience laboratory where the spirit of progress and intelligent experiment prevails, and ample equipment for meeting and solving its problems is supplied. Books are placed last because they are symbolical but readily assimilated when the reader has a basis in experience for understanding.

The educational department of the Consolidated Gas, Electric Light and Power Company, has the responsibility for directing and coordinating the educational and training work of the company. The fundamental purpose is to promote efficiency and cooperation; to bring about a better understanding of policies, requirements, and the interrelations and scope of the company's operations; to develop employees to greater usefulness to the company and to aid them to deserved promotions in the organization.

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What Occupies the Attention of the Gas Men of Today?

KURWIN R. BOYES, Secretary Relations with Affiliated Associations

THE POWER OF CLAIRVOYANCY is neither claimed nor required to answer accurately the question, "What occupies the attention of the gas men of today?" There are at the present time fifteen state and district gas associations and one geographic division affiliated with the American Gas Association. Each of these associations, including the national, was organized and is directed by and for gas men. Naturally, the subjects chosen for addresses, papers, discussions, and committee reports at their meetings are those which are at the time uppermost in the minds of the active and thinking men, the leaders, of the industry.

The programs for twenty-two meetings held during the year commencing August, 1923, show that no less than 252 papers, addresses, discussions, and reports were presented at those meetings, or an average of over eleven per meeting.

The matter of public relations wins the blue ribbon as it has been touched on in no less than 25% of the total 252 items on the programs. It was the outstanding subject at all meetings. The importance of the best public relations has not only been finely expounded but instructions have been freely given on how to obtain the goodwill every utility man desires.

In order to arrive at a conclusion on the general trend of thought, the subjects were classified under the headings General, Accounting, Commercial, Industrial Gas, Manufacturers, Publicity and Advertising, and Technical—in line with the sections of the American Gas Association. The subjects considered under General were those which cannot be specifically classified under one of the others.

As may be expected the greatest number, 28%, of the subjects fall under the diversified general classification. It is most interesting to note that 26% of the subjects presented were of a technical nature with the next, that of industrial gas, having 14% to its credit. The intricacies of manufacture and distribution of gas are receiving close attention, working toward even greater efficiencies with the resulting reductions in operating costs.

Industrial Gas

It has been evident to those in intimate contact with gas association work that industrial gas matters have prominently occupied the close attention of the gas men during the year. More than ever before the great possibilities in the use of gas in industry are realized and studied and the subject has been treated from all angles at practically every one of the twenty-two meetings considered. Papers have been delivered on what can be expected in the sale of industrial gas and how to obtain such sale. Specific application of gas to such uses as bake ovens, house heating, steam boilers, large cooking installations, water heating, refrigeration, etc., have been explained. A glance at even the subjects of papers delivered last year is a sure cure for the sceptic as to the potential field in the industrial use of gas.

Perhaps it would more strongly emphasize what at least some of the gas men think about the industrial use of gas if a

speaker, a leader in the industry, at the 1923 Convention of the American Gas Association is quoted. He said in the course of an address on "Industrial Gas—Its Place in the Industry": "I personally believe that, if every section of this convention, and I will bar none, should close their doors, and the entire time and attention of the convention were centered upon the problems relating to the application of gas for industrial purposes, that the greatest good would thereby arise."

Technical

The history of improvements to gas making apparatus could be accurately developed from an analysis of past association programs. The development last year which received greatest attention was the backrun process, provision being made for it at eight meetings. General descriptions of the process were given at some of these meetings, at others specific installations were described and the results obtained with its use reported.

The technical men are apparently thinking a lot about purification. Results obtained by liquid purification were frequently presented during the year with descriptions of specific installations. A development in the gas industry, as elsewhere, is particularly interesting when actual operating results can be reported and these results discussed.

The gas man interested in distribution work has not hesitated to give voice to his thoughts at association meetings. The maintenance, repair and standardization of consumers' meter seems to be particularly interesting to him. However, he has also given attention to such matters as "Gas Leaks in Paved Streets" and "Use of Mechanical Equipment in Connection with Distribution Work." The A.G.A. Distribution Design Committee report, presented at the 1923 Convention proved to be an instructive one to the man in the distribution department and considerable interest has been manifested in it.

But a very few years ago the supply of fuel occupied the center of the stage of interest. It has now been relegated to the background; last year there were only two papers on the coal situation. Speaking of fuels reminds the writer of two papers, one on the use of bituminous coal for generator fuel in a water gas machine while another discussed a miture of coal and coke for the same purpose.

Accounting

A study of the wide variety of accounting subjects treated indicates that apparently the field was thoroughly covered. Bookkeeping without books still maintains a position of prominence in a gas company accountant's mind; four papers were required to further describe this system.

"What Kind of Insurance Should a Gas Company Carry?" is a question, the answer to which would hold the interest of almost every gas man. There is no doubt that the outstanding work accomplished by the Insurance Committee of the American Gas Association has done much toward fostering a lively interest in proper gas company insurance and the presentation of such papers as the above mentioned. A number of interesting papers were delivered on this subject during the year.

Commercial

It has been a lively year for the commercial man. He has been told how to stimulate gas and appliance sales through prize contests, more effective advertising, better window displays, establishment of home service departments, sales

campaigns, and a new and novel plan of compensating salesmen. There have been a number of papers delivered under wide awake and promising titles such as "The Gas Company as a Merchandiser—More Effort—More Sales."

Regulatory

The gas man of today apparently gives a whole lot of thought to the state regulation of his company. He likes to hear what the commissioner has to say in regard to the operation of a gas company, in other words, to obtain the benefit of the commissioner's viewpoint and experience on such matters as public relations, rate making, public information committee work, etc. The gas man recognizes that the position occupied by a commissioner peculiarly qualifies him as a speaker at a meeting of utility men.

Publicity and Advertising

The publicity and advertising men have been busy talking on state public utility committee work. Nearly three-quarters of the papers classified under publicity and advertising told how the state committee work ties in directly with practically all the activities of a gas company. Particular emphasis has been laid on the necessity of cooperation on the part of gas company executives with their local committee.

An address on "Advertising—How It Functions—What It Accomplishes" proved as instructive and as interesting as the title would imply. This was just one of a number of papers on advertising given to promote more and better advertising.

Inspirational papers and addresses are by no means missing on association programs and it is always a pleasure to see how well they are received. The following is a quotation from a paper delivered at a gas association meeting: "If it be that that time shall come into our own experience when we shall love to dwell upon things of the past, it will be a pleasanter and better memory that shall recall personal associations which were genuine, opportunities which were embraced, problems whose honest solutions were attempted—a business life as fair in war as in peace."

Conclusion

From a review of the programs of meetings of gas associations for the past year, two things stand out. First, the titles of the addresses and papers. These titles are of a nature that they make one fairly itch for sufficient time to get copies, if available, and dig into them. It is always a liberal education to get another's point of view on your own pet subject. The second impression gained in looking over the programs is the balance of subjects treated on these programs. Even at comparatively small meetings it is evident that efforts were made to present subjects of interest to all the men attending. For instance, one meeting had talks covering taxes, customer ownership, service, technical subjects, industrial gas and accounting. Every gas man can find something of interest and value to him on such a selection of subjects.

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Affiliated Association Notes

Pacific Coast Gas Association

The southern sectional meeting of the Pacific Coast Gas Association, held in Los Angeles on July 11 and 12, was a particularly successful one. Business sessions were held both days. They were presided over by President H. R. Basford and attended by members of the executive committee and heads of the major standing committees. Reports were received and discussed. An important subject of discussion was the proposed reorganization of the Association through a revision of its constitution and by-laws. It is proposed to rearrange the Association membership into classes and to put the direct management of the Association into the hands of an Executive Secretary who shall devote his whole time and attention to the work at permanent headquarters in San Francisco and with such clerical help as may be needed.

Another matter disposed of at the business session was the adoption of final arrangements for the Santa Barbara convention which will be the 31st annual gathering of the P. C. G. A. since its formation in 1893. The convention will be opened on the afternoon of September 15th and will last the remainder of the week. On account of the increased interest in the different branches of the gas industry whose representatives make up the personnel of the Association, it has been decided to hold parallel sessions this year. There will, of course, be the usual program of entertainment and, as is customary, the golf tournament will attract general interest.

Probably the most important feature of the gathering in Los Angeles was the technical session held on the afternoon of July 12 in the new headquarters building of the Southern California Gas Company. Papers of an unusually interesting character were presented by Messrs. Harry L. Masser and Charles M. Grow. Mr. Masser's paper dealt with the reforming or "cracking" of natural gas, a practice adopted by gas companies in southern California, particularly Los Angeles and Santa Barbara. This reforming process consists of a breaking up of the natural gas into a gas whose characteristics are similar to those of manufactured gas. The natural gas is put through regular oil gas generators and subjected to a temperature of approximately 1800 degrees Fahrenheit, the result being a product of lower heating value than natural gas but of largely increased volume. The process described is unique to California and the results obtained are so beneficial as to be of interest to the gas industry everywhere. Mr. Grow's paper was on the activities of gas companies in promoting industrial gas sales. It was, in effect, a history of this phase of the business from the beginning and showed the vast strides made by the companies in calling general attention to the value of gas as an industrial fuel.

Affiliated Association Notes

The gathering closed on the evening of July 12 with a banquet at the Hotel Alexandria in Los Angeles at which the assemblage numbered 314, an unusual turnout for a sectional occasion. There were two leading speakers on the program. First came Professor C. A. Gummere, Lecturer on Commerce in the University of Southern California, who entitled the subject of his address, "Knowing." In this he made the point that education was the main factor in any successful career. He was followed by Mr. James W. Foley, poet, humorist and newspaper man, who in his quaint, original fashion preached the gospel of optimism.

Pennsylvania Gas Association

The new 1924 Membership List of the Pennsylvania Gas Association indicates a good, healthy growth in membership in a comparison with the list for 1923. The 1924 list registers a total of 230 active individual members, indicating a gain of 106 during the year. It also gives 77 associate individual members, showing another gain of 16. This Association has a company membership of 53. The question naturally arises as to how this growth compares with that of the other associations.

Michigan Gas Association

The 32nd Annual Meeting of the Michigan Gas Association will be held in Detroit on September 9, 10 and 11. Although the program had not been received in time for inclusion in this issue, Secretary A. G. Schroeder states that it is an unusually attractive and interesting one. President George H. Waring hopes to make this meeting an outstanding one in the history of the Association.

New Jersey Gas Association

It has been decided to postpone the Mid-Summer Meeting of the New Jersey Gas Association to September 19 as the date previously set, September 12, has been proclaimed by the President of the United States as Defence Day.

The meeting is to be held at the Ocean City Yacht Club, Ocean City, N. J. The program is as follows—

10-11 A. M.—Business Session

11 A. M.-12.30 P. M.—Bathing Contest

12.30-2 P. M.—Shore Dinner

2-3 P. M.—Treasure Hunt

Starting at 3 P. M. sailing (within the twelve mile limit) will be in order.

Ladies are invited to attend and join in all the sports.

Associations Affiliated with A. G. A.

Canadian Gas Association
Date of Affiliation—Mar. 25, 1919.
Pres.—C. A. Jefferis, 265 Front St., E., Toronto, Ont., Canada.
Sec.-Tr.—G. W. Allen, 7 Astley Avenue, Toronto.
Conv., Toronto, Ont., Aug. 28, 29, 1924.

Empire State Gas and Electric Association
Date of Affiliation—Nov. 21, 1919.
Pres.—S. J. Magee, Associated Gas & Electric Cos., Ithaca, N. Y.
Chairman Gas Section—F. F. Ingwall, Binghamton Gas Works, Binghamton, N. Y.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.
Annual Meeting, 1924.

Illinois Gas Association
Date of Affiliation—Mar. 19, 1919.
Pres.—J. G. Learned, Public Service Co. of Northern Illinois, Chicago, Ill.
Sec.-Tr.—R. V. Prather, 305 Illinois Mine Workers Bldg., Springfield, Ill.
Conv., 1925.

Indiana Gas Association
Date of Affiliation—April 24, 1919.
Pres.—G. M. Johnson, Northern Indiana Gas & Electric Co., South Bend, Ind.
Sec.-Tr.—E. J. Burke, Citizens Gas Co., Indianapolis, Ind.
Conv., 1925.

Iowa District Gas Association
Date of Affiliation—May 21, 1919.
Pres.—H. J. Carson, Cedar Rapids Gas Co., Cedar Rapids, Ia.
Sec.-Tr.—H. R. Sterrett, 551 Seventh St., Des Moines, Ia.
Conv., 1925.

Michigan Gas Association
Date of Affiliation—Sept. 18, 1919.
Pres.—Geo. H. Waring, Powers Theatre Bldg., Grand Rapids, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.
Conv., Detroit, Mich., Sept. 9, 10, 11, 1924.

Missouri Association of Public Utilities
Pres.—C. L. Proctor, Empire District Electric Co., Joplin, Mo.
Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.
Conv., 1925.

New England Association of Gas Engineers
Date of Affiliation—Feb. 19, 1919.
Pres.—C. R. Prichard, Lowell Gas Light Co., Lowell, Mass.
Sec.-Tr.—J. L. Tudbury, 247 Essex St., Salem, Mass.
Conv., 1925.

Gas Sales Association of New England
Date of Affiliation—Oct. 1, 1919.
Gov.—J. J. Quinn, Citizens Gas Co., Quincy, Mass.
Sec.—J. H. Sumner, 719 Massachusetts Ave., Cambridge, Mass.
Annual Meeting, 1924.

New Jersey Gas Association
Date of Affiliation—April 25, 1919.
Pres.—Raymond W. Lee, Cumberland County Gas Co., Millville, N. J.
Sec.-Tr.—R. A. Koehler, Public Service Gas Co., Newark, N. J.
Conv., January, 1925.

Pacific Coast Gas Association
Date of Affiliation—Sept. 18, 1919.
Pres.—H. R. Basford, H. R. Basford Co., San Francisco, Cal.
Sec.-Tr.—W. M. Henderson, Los Angeles Gas & Electric Corp., Los Angeles, Calif.
Asst. Sec.—Clifford Johnstone, 619 Wells Fargo Bldg., San Francisco, Calif.
Conv., Santa Barbara, Cal., Sept. 15-19, 1924.

Pennsylvania Gas Association
Date of Affiliation—April 10, 1919.
Pres.—John A. Frick, Allentown-Bethlehem Gas Co., Allentown, Pa.
Sec.-Tr.—Geo. L. Cullen, Harrisburg Gas Co., Harrisburg, Pa.
Conv., 1925.

Southern Gas Association
Date of Affiliation—May 20, 1919.
Pres.—W. H. Taylor, Georgia Railway & Power Co., Atlanta, Ga.
Sec.-Tr.—J. P. Connolly, 141 Meeting St., Charleston, S. C.
Conv., Wilmington, N. C., June 9-11, 1925.

Southwestern Public Service Association
Date of Affiliation—September 26, 1923.
Pres.—G. W. Fry, West Texas Utilities Co., Abilene, Texas.
Chairman Gas Section—F. C. Armbruster, Southwestern Gas & Elec. Co., Shreveport, La.
Sec.—E. N. Willis, 403 Slaughter Bldg., Dallas, Texas.
Conv., 1925.

Wisconsin Utilities Association
Date of Affiliation—March 25, 1919.
Pres.—G. C. Neff, Wisconsin Power & Light Co., Madison, Wis.
Chairman Gas Section—J. G. Felton, Northern States Power Co., La Crosse, Wis.
Exec.-Sec.—J. N. Cadby, 445 Washington Bldg., Madison, Wis.
Conv., 1925.

Geographic Divisions

Eastern States Gas Conference
Date of Formation—April 11, 1923.
Pres.—P. S. Young, Public Service Gas Co., Newark, N. J.
Sec.-Tr.—R. A. Koehler, Public Service Gas Co., Newark, N. J.
Conv., April, 1925.

ACCOUNTING SECTION

W. A. SAUER, Chairman — H. C. DAVIDSON, Vice-Chairman

H. W. HARTMAN, Secretary

MANAGING COMMITTEE—1924

ARMSTRONG, J. J., Toronto, Can. (Canadian)
BARTON, W. H., Portland, Ore.
BISSELL, J. H., Boston, Mass.
BLANCHFIELD, J. J., Brooklyn, N. Y.
CARROLL, H. P., Beaumont, Texas. (Southwestern)
CLINTON, DEWITT, Worcester, Mass. (N. E. Gas Eng.)
DOERING, W. A., Boston, Mass.
FREY, H. F., Allentown, Pa.
HAASE, EWALD, Milwaukee, Wis. (Wisconsin)
HALL, I. S., Boston, Mass.
HEINS, J. W., Philadelphia, Pa.
HOFFMAN, F. C., St. Paul, Minn.
JAMES, F. M., Aurora, Ill. (Illinois)
JAMES, W. H., Petersburg, Va. (Southern)
KELLER, A. R., Syracuse, N. Y.
KURTZ, ADAM, Detroit, Mich. (Michigan)
LAWALL, H. J., Philadelphia, Pa.
LAWRENCE, JAMES, New York, N. Y.
MEYERS, W. J., New York, N. Y.
MURPIT, W. G., Newton, Pa.
PAGE, HOMER, Charleston, S. C.
PATTERSON, F. H., Rochester, N. Y.
PETTES, W. H., Newark, N. J. (New Jersey)
PLATT, C. W., Portland, Ore. (Pacific Coast)
PORTER, EDWARD, Philadelphia, Pa. (Pennsylvania)
POTTER, C. F., Newark, N. J.
REESE, J. G., Baltimore, Md.
REYNOLDS, A. E., Springfield, Mo. (Missouri)
SCHMIDT, WM., JR., Baltimore, Md.
SCOBELL, E. C., Rochester, N. Y. (Empire State G. & E.)
SCOTT, J. M., Wilmington, Del.
SEARING, R. B., Sioux City, Ia. (Iowa)
SEARLE, A. A., New York, N. Y.
SHORT, A. F., Providence, R. I.
TOSSELL, A. L., Chicago, Ill.
TRACY, F. B., Muncie, Ind. (Indiana)
WILBUR, A. A., Brockton, Mass. (Gas Sales of N. E.)
WINTERS, A. C., Chicago, Ill.

CHAIRMEN OF SECTIONAL COMMITTEES ORGANIZED TO DATE

Analysis of Gas Company Statistics—H. J. LAWALL, Philadelphia, Pa.
Budget—F. H. PATTERSON, Rochester, N. Y.
Customers Accounting—H. J. FREY, Allentown, Pa.
Insurance—J. G. REESE, Baltimore, Md.
Nominating—J. W. HEINS, Philadelphia, Pa.
Relations With Customers—DEWITT CLINTON, Worcester, Mass.
Improving Relations Through Employees Visiting Customers' Premises—W. H. BARTON, Portland, Ore.
Errors, Their Correction and Prevention—J. M. ROBERTS, Chicago, Ill.
Security Holders' Records— E. MACMONNIES, Philadelphia, Pa.
Welfare Systems—O. F. POTTER, Newark, N. J.
State Representatives and Contributions to Monthly—A. L. TOSSELL, Chicago, Ill.
Uniform Classification of Accounts and Form of Annual Report to Public Service Commissions—W. J. MEYERS, New York, N. Y.

Methods of the Statistician

G. S. CREMER, Brooklyn Union Gas Co., Brooklyn, N. Y.

This paper will form part of the 1924 report of the Committee on Analysis of Gas Company Statistics. (EDITOR'S NOTE.)

TO DEFINE the statistician and the scope of his work it is necessary to state the sense in which the word "statistics" is used. There is no single conception of the meaning of statistics which is universal in its application.

In a general or theoretical sense, we may say that the science of statistics is a method of dealing with large numbers. In order to give an accurate definition in a more specific and more practical sense, we must distinguish between descriptive statistics which consists of the records of facts discovered through investigation; statistical method, which is a set of rules to be followed in placing an interpretation upon such data; applied statistics, which is the art of applying these rules to concrete problems; and scientific statistics, which consists of applying the rules of statistical method to scientific investigations.

Characteristics of the Statistical Method

The statistical method has been defined as the method of placing an interpretation upon masses of data by means of certain processes of summarization, through which a definite conclusion is reached and proved. It may be the aim of the statistician to prove or disprove some theory which has been formed beforehand, or it may be that there is no indication whatever of what will be the conclusion to which the data he is called upon to interpret will lead; in either case the methods and processes of his work will be the same, and the facts upon which he bases his conclusion will be arranged and displayed in an orderly manner for the inspection of all who care to follow through. The old saying that "figures don't lie, but liars do figure" has been used many times to discredit the truth of conclusions reached by the statistical method. There are, it is true, liars who make use of the statistical method, but the definite path through which they must travel, a path whose every turn is known to all who understand statistics, makes false conclusions advanced intentionally with the object of deceiving, and false conclusions reached with honest intent through defective reasoning, alike sure to be detected and disproved.

The processes of summarization are best described under four principal heads:

1. Classification.
2. Averaging.
3. Comparison.
4. Presentation.

The Principles of Classification

Statistical classification consists in the arrangement of statistical data in a way that will make possible its interpretation through the computation of averages, the application of comparisons, and a logical presentation.

Statistical units are of two kinds; units of enumeration and units of exposition. Except in the case of simple linear or quantitive measurements, units of enumeration require most careful definition in accordance with their purpose. For example, in order to define types of accidents for the purpose of enumerating accidents subject to workmen's compensation claims, it would be necessary first to analyze the workmen's compensation law which is in effect in the place where the study is to be made. Units of exposition are units of comparison used for the purpose of interpretation and presentation. It might be found, for instance, that in a certain section of a town there is one gas meter in use for every five inhabitants, and that the average quantity of gas sold per month through each meter is nine hundred cubic feet. In the first case the coefficient would be .2 and in the second case 900. If these two units of exposition were to be further defined and limited to a study of grocery stores, it might be found that the coefficient of meters would be 1.4 and the coefficient of consumption 4,500.

The art of tabulation is based on classification, and consists in arranging information in the form of tables according to classifications which have been decided upon. The ordinary type of table is the double entry table, which may be read from either of two starting points, which are: (1) the stub, which shows the basis of horizontal classification, and (2) the caption, which shows the basis of vertical classification. Tabulation gives to the statistician the basic figures to which the other three processes of

summarization are applied. Very frequently, when the purpose is merely to furnish information without pointing out any conclusion to be drawn therefrom, the work of the statistician goes no further than tabulation.

The Functions and Limitations of Averages

The purpose of averages is to discover and point out the general trend of large masses of figures, which casual inspection or even careful examination might not make evident. In making such an interpretation details must be neglected, because the essential purpose of averages is to throw aside details and uncover the larger facts which are hidden beneath them.

There are several types of averages available for use, although most people think only of the arithmetic average when the word "average" is mentioned. Each of the several types has its special uses and its limitations, and the usefulness of one type may be chiefly to overcome the shortcomings of another. They may be briefly enumerated as follows:

1. The simple arithmetic average, which is the most commonly used, and the one easiest of application. It is obtained by dividing the sum of the items in a series by the number of items. It gives an approximate representation of the value of the series, subject to some inaccuracy due to the fact that the number of times each item occurs is not considered. It may be very considerable influenced by one or more items which differ widely from the rest of the series.

2. The weighted arithmetic average, in which one of the shortcomings of the simple average is overcome by giving consideration to the frequency with which each item in the series occurs: that is to say, three similar items are considered as three separate items. Like the simple average, it may be seriously affected by a few items which differ very much from the rest. For example, a few consumers using 1,000,000 cubic feet of gas per month might completely destroy, for some purposes, the value of an average consumption per consumer.

3. The mode, which is the typical item in a statistical series. It is never an abstract mathematical conception, as is the arithmetic average, but is always real though there is not necessarily a mode in every series. It is located, not by any mathematical operation, but by inspection and grouping of the items in the series.

4. The median, which is the middle item in a series of single items arranged in the order of their magnitude. If the number of items is even, the median is non-existent, but theoretically lies between the two middle items. It is not affected by the magnitude of the items in the series, but marks merely the mid-point in the array.

5. The geometric mean, which is the nth root of the product of all the items in a series, n being the number of items. It is used chiefly in computing index numbers.

The Analytical Significance of Comparisons

The comparison of two sets of statistical data has for its object the determination of what connection, if any, exists between the occurrences on which they are based. It is possible not only to determine the existence of such connection,

but to calculate its degree and express the result in mathematical terms. Comparison may be undertaken either to discover a relationship, or to trace and follow up a relationship already known or assumed to exist.

There are a great many different methods of comparison, each one of which has its usefulness, for certain definite purposes. Some of the more common methods are:

1. Simple tables and historigrams (or simple graphs), used to show the absolute as well as the relative sizes of the items in the groups compared.

2. Percentage tables and historigrams which are used to show more clearly the relative sizes of the items in the groups compared, but do not show the absolute sizes.

3. Absolute cumulative tables and ogives (or cumulative curves), which are useful in locating the median, and also are used to supplement simple tables, in order to show the accumulation of the items in a series which represents a definite period. For example, the number of gas stoves sold during each month in a year would be shown by a simple table and historigram, and the number sold so far during the year, at the close of each month, would be shown by a cumulative table and ogive.

4. Percentage cumulative tables and ogives, which for purposes of comparison are frequently better than absolute cumulative tables and ogives.

5. Lorenz tables and curves, with which by reducing all of the items in both of two groups of different natures to a percentage basis, it is easy to show graphically the degree of dispersion (or deviation from equal distribution), which exists in the two groups. For example, the distribution of gas to large consumers and small consumers may be very clearly represented by the use of Lorenz tables and curves.

Methods of Presentation

Presentation is the last of the four processes of summarization which constitute the statistical method. Classification supplies the basis for averaging, comparison interprets the true significance of the data, the presentation is the art of setting forth the result of the statistician's work in a manner which will be both intelligible and convincing.

To some persons, figures are more easily understood than charts. To others, charts are a necessary means of securing a grasp of figures. To all, regardless of temperament or training, properly constructed charts are of too great value to be neglected.

Regardless of whether or not the conclusions to be presented are such that they can be readily charted, the results of the statistician's work of classification, averaging, and comparison must be tabulated, and the tables may be the only way in which the conclusions will appear in the report, or they may be used as the basis from which graphic charts are constructed. In either case, they will be subject to the closest scrutiny by all interested parties. Tabulation is really the basis of the art of presentation, and in the larger part of the statistician's work, it is both the beginning and the end of the presentation. Financial and operating reports, for example, show in tabular form the results of classification, averaging, and comparison, as to all of the items

which are reported upon, and in graphic form only a few items which are peculiarly suited to graphic presentation.

The Relationship Between Accounting and Statistics

We have already defined statistics, and have pointed out some of the uses to which the art can be put, but it is still necessary to determine what is the proper relationship between accounting and statistics, and to show where the functions of each begin and end. Perhaps the most prevalent idea on the subject is that statistics covers all the underlying physical data not capable of being expressed in terms of money and, therefore, not included in the regular accounts, and that accounting covers the expression, in terms of money, of all of the affairs of the business which are capable of being so expressed. This is the definition which an accountant would give. On the other hand, a statistician, after defining his art and explaining its many uses in the way which was done in the first part of this paper, would define accounting as a branch of financial statistics, having for its object the recording, in terms of money values, of the current events of a business enterprise, both as an operating record and for the purpose of comparing various phases of the business at different times. It might be worth while to mention, in passing, that the formation of the accounting period, on which the fundamental distinction between capital expenditures and operating expenditures is based, is a device of comparatively recent origin (certainly subsequent to the seventeenth century) intended to make possible comparison of the status of a business at definite intervals of time and comparison of operating results during definite periods of time.

The broader conception of the relation between accounting and statistics makes it plain that in any business establishment the accountant and the statistician must work hand in hand, and in many cases both positions will be filled by one and the same person. The only distinction which can really be drawn between the two is that the accountant is a specialist, who uses the several processes which constitute the statistical method in the interpretation and presentation of data expressed in terms of money.

Methods Used in Special Studies

The methods used by statisticians in special studies dealing with economic questions which may determine the administrative policies of the heads of a business enterprise are all based upon the four processes of summarization: classification, averaging, comparison, and presentation. The motive running through all of these processes is to discover causes and their effects and to establish the degree of relationship between them.

A brief description of three types of special studies will serve to illustrate the usefulness of statistics in the gas industry.

Computing the Effects of Several Causes of Variation in Production Cost

Sometimes the causes of variation are already known, and all that remains is to calculate and prove their effects. We might take for an illustration a brief form of calculation showing the causes of an increase in the production expenses of a gas company. The accountant has prepared a statement in which the amounts of the corresponding items in each of the two periods to be compared are set down side by side, and the increases and decreases are figured. There are also columns in which the unit costs

are set down, together with their increases and decreases, and sometimes there are supplementary schedules in which some of the items are subdivided. Then, ordinarily, the accountant is through. He has done his best. It is a bit puzzling that after the two and a half centuries which have elapsed since it became customary to split up the records of a business into accounting periods in order to make comparisons possible, so little progress in the art of comparing accounting records should be apparent. The equation between cause and effect is lacking in the usual style of comparative statement, but it is surprising how easily the causes of variation may be determined and their effect computed when the statistical method is applied.

fects and prove that the entire amount of the variation is accounted for.

One example is sufficient to illustrate the method of computation which would be applied to each separate item in the cost sheet. Oil is usually the largest single item of cost in the manufacture of water gas. Variations in the cost of oil used during any period may be due to changes in any or all of three factors:

1. The quantity of gas made.
2. The price of oil.
3. The quantity of oil used per thousand cubic feet made.

Let us suppose that the records show the following figures with reference to gas oil:

	Cost of Oil Used	Number of Gallons Used	Average Price of Oil per Gallon	M. Cu. Ft. of Gas Made	Gallons of Oil Used per M. Made
This year	$3,232,203.77	57,263,048	$.056444843	16,185,984	3.53781692
Last year	3,259,870.45	58,876,356	.055368074	13,996,990	4.20635836
Increase or decrease	(D) 27,666.68	(D) 1,613,308	.001076769	2,188,994 or 15.63903382%	(D) .66854144
Increase in cost due to increase in quantity of gas made: $3,259,870.45 × 15.63903382% =				$509,812.24	
Increase in cost due to increase in price of oil: 57,263,048 gallons × $.001076769 =				61,659.07	$571,471.31
Decrease in cost due to decrease in quantity of oil used per thousand cubic feet of gas made: 16,185,984 M. cu. ft. × .66854144 gal. × $.55368074					599,137.99
Decrease in cost of oil used during the year					$27,666.68

Forecasting the Extent and Direction of Population Changes

Accurate forecasting of the extent and direction of changes in population is necessary in forming plans for the location of new production plants and for exercising control over extensions of the distribution system.

The procedure is to isolate all of the several causes of variation which can be identified, and to first measure the effect of each one separately, assuming for the purposes of the computation that it is the only cause of variation which exists; then to combine the several separate ef-

All population studies are founded on the assumption that, in the absence of any disturbing factors, population will increase according to a certain definite ratio, in the form of a geometric progression. That is to say that if the ratio of increase is 6%, the population at the end of each year will be 1.06 times the population at the end of the preceding year. The basic hypothesis of all statistics predicated on human activity is expressed in the words "other things being equal." But other things are not equal, and many things must be considered in connection with the ratio increase which is indi-

cated by previous experience. The smaller the section under observation, the greater the probability that other factors will alter the result. The problem of the gas company is to discover all of the possible causes which might disturb the regularity of the geometric progression, and to estimate what will be their probable effect. A few of these factors are:

1. Transportation facilities.
2. Building restrictions.
3. Class of people.
4. Character and prosperity of industries.
5. General prosperity.

Changes in any of these factors, either in the territory under consideration, or in neighboring territory, will alter very suddenly the rate of increase in population.

But the consumption of gas will not vary in the same proportion as the population. It may be affected by changes in the standard of living, changes in general business conditions, or changes in the character of the industries carried on.

Proving from Records of Previous Periods the Probable Result of Proposed Rate Changes

To show in a convincing manner from past records what will be the effect of proposed rate changes, it is necessary to combine the methods of calculation based upon known facts, as described in the first illustration, dealing with the causes of fluctuations in production costs, and the methods of estimating the probable results of conditions as yet unknown, indicated in the second illustration, dealing with population studies. The accuracy of an estimate of the probable effect of a change in rates may often be entirely dependent upon the accuracy of an estimate of changes in population and gas consumption made previously or coincidentally.

The presentation of the material covered by this paper has necessarily been brief and perhaps neither intelligible to one who has not already had training in the use of statistics, or useful to one who has had such training. Our object has been to show clearly that the statistician has at his command methods which are of real and vital use to those whose duty it is to manage and direct the gas industry, and in this we think we have succeeded.

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Accounting Section's Exhibit
At Atlantic City

The Accounting Section of the A. G. A. will occupy booths Nos. 195, 196, 205 and 206 at the coming Exhibition on the Steel Pier. Do not fail to pay these booths a visit.

HOW MUCH LONGER CAN HE GET BY WITHOUT PAYING?
---DALLAS NEWS.

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Customers Present at Convention of Utility Men

A NEW CHAPTER has been added to the history that is being made by the public utility industry as it bends its efforts toward establishing a more friendly customer-interest in its affairs.

This new chapter was written during the recent joint convention of the Wyoming Utility Asssociation and the Rocky Mountain Committee on Public Utility Information, held recently at Casper, Wyoming.

In keeping with their policy of making the utilities public in fact as well as in name, E. P. Bacon and other officials of the two organizations issued a general invitation to the people to be present during the deliberations at the two-day session. Several customers of the local light, telephone, gas and bus transportation companies responded, thus convincingly demonstrating that people now have more than a mere bill-paying interest in their utility institutions.

During the meeting President Bacon announced that he would be glad to have all customer-delegates participate in the discussions or voice any criticism. The self-elected representatives of the telephone-talking, light-using, gas-cooking and car-riding public offered no criticism.

Instead, one of their number volunteered that, "The utilities are on the right road and seem to be approaching the goal of public favor more rapidly than any other line of business."

The speaker concluded with the observation: "You men are certainly doing your part; I think that we—your customers—everybody—should at least meet you halfway, for, ultimately, we will benefit the most."

THE touch of a match—that is all that is necessary to start your bright, steady blaze, if you have gas range.

There is no kindling to cut. No fuel to carry No ashes, dust or grime. Nobody who uses an ordinary cooking stove will ever know the joy of complete convenience until she starts to use gas as a fuel.

And there are other advantages to the user of gas. The heat in the stove is constant, for one thing. It is not a roaring furnace one minute, and nearly out the next. You can regulate the blaze to suit each kind of cooking. You do not have to have the whole top of your stove hot when you only have one pot boiling.

Add to this the economy of gas as a fuel, and the fact that it is always there—never in danger of running out right when you need it most—and you understand why practically every housewife in this city prefers gas to cook with.

We have a complete line of gas ranges, of all sizes, forms and prices. Our service extends from the distribution of the gas itself, thru the selling of the appliances, to every form of cheerfully given service.

Kansas Gas and Electric Company

"At Your Service"

Another effective Kansas Gas & Electric Ad.

Paris Celebrates a Century of the Gas Industry*

The Present-Day Realization of Philippe Le Bon's Dream of Illumination by Gas—A History of the Industry Shown at the Paris Exhibition.

ALVAN F. SANBORN

THE INTERNATIONAL EXPOSITION now being held in honor of the centenary of the creation of the gas industry is a striking fulfilment of a prediction made in the closing years of the eighteenth century.

In 1797, at Brachay, a rural community of the Haute Marne near Chaumont, Philippe Le Bon, an engineer born in the village thirty-four years before, who had just succeeded in devising a simple apparatus for demonstrating the illuminating properties of the vapors produced by the distillation of wood, said to his incredulous fellow-villagers:

"Good friends, I will heat and light you from Paris to Brachay. Flaming gas will come to cook your food, which, as well as your cooks, will no longer be exposed to the scorchings and to the fumes of coal. It will warm up this same food on your tables, will heat your ovens and the water for your bath and for your washings and will dry your linen, with all the economy you can desire."

Today, in France, the gas industry distils more than 4,500,000 tons of coal annually and supplies more than 17,000,000 persons distributed among 1500 towns and cities, with gas for lighting and heating purposes—England with a population only a little larger consumes four times as much—while the by-products of this distillation, employed in agriculture alone, are the basis of chemical industries representing a capital of more than five billion francs.

Philippe Le Bon

Philippe Le Bon did not, as is often affirmed, discover illuminating gas. Nobody can fairly be said to have done that, since its existence in a natural state in different quarters of the globe was known from the earliest times. Furthermore, in the sixteenth century, divers experimenters discovered that coal and wood heated in a closed receptacle emitted a gas susceptible of being ignited which they named "inflammable air," and the Hollander Minkelars (to whom monuments have been erected at Louvain, Maestricht and Turin) applied this inflammable air to the inflation of balloons in 1783. But Le Bon seems to have been the first to utilize "inflammable air" practically for purposes of illumination and to foresee the greater part of its subsequent applications.

His career, brief and tragic, but productive of far-reaching results, is in every way worth narrating.

Graduated first from the Ecole Polytechnique and then with the rank of major from the Ecole des Ponts et Chaussées, Philippe Le Bon was stationed for a time at Angoulême, where his superiors complained because he was in the habit of withdrawing for days at a time to his native village for his personal experiments.

In the course of one of these stolen absences, he heated some sawdust in a glass retort and lighted the resultant gas, which burned continuously with a dull blue flame. In order to hold in his

*Reprinted from the Boston Evening Transcript.

hand more easily the bulb of the retort, he wrapped a wet cloth about it. Instantaneously the flame became limpid and brilliant, and it was then that he made to his fellow-villagers the prediction cited above, which, instead of impressing them, caused them to treat him as a bit daft. By way of proving his case, he proceeded to construct for the distillation of wood a small oven, whence the gas produced was conducted through water to a simple burner, giving to the apparatus the name of thermolampe. In 1799, after a variety of successful experiments with his thermolampe, he made a formal report to the Institute of France, took out a patent (or what at that time was the closest approach thereto), and printed and circulated tracts of propaganda containing in somewhat different language substantially the same predictions he had made to his neighbors.

Named in August, 1802, chief engineer of the Department of the Vosges, Le Bon declined this important post, because it would interfere seriously with his experimentation, and he demanded and obtained, instead, a place in the capital as aid to the chief engineer of the Ponts et Chaussées, Blin, then occupied in paving the city. He lodged on Ile Saint Louis in the Hôtel Seignelay. There he set up a number of thermolamps, lighting the rooms of the hotel and illuminating its garden and courtyard with garlands, cascades and other decorative motives, which attracted crowds of visitors from all over the city, but which, far from putting money in his purse, seriously depleted it.

Victim of Foot-Pads

In order to get means for further experimentation, Le Bon went into the tar business, setting up ovens in the forests in the vicinity of Le Havre and contracting with the Government to supply tar to the national marine. The enterprise prospered, and he was beginning to see his way clear to a commercial exploitation of his patent by the founding of a gas company, when a strange thing occurred, which terminated his career and retarded materially the development of the gas industry in France.

While in Paris, in 1804, to witness the ceremony of the coronation of the Emperor Napoleon, he set out to cross, after nightfall, the Champs Elysées (at that time a tract of waste land notoriously infested with disreputable characters), and the next morning his body was found covered with knife wounds. The same night, his Ile Saint Louis apartment was rifled by robbers.

Stealing Le Bon's Thunder

The mystery was never cleared up. But the simultaneity of the attack upon Le Bon's person and upon his apartment suggests that the crime was not due to common criminals but was instigated, if not actually committed, by a party who knew the victim well and who hoped to profit by his disappearance. And such a party, though in the total absence of proof no charge was ever brought against him, was one Winzler, a polyglot Austrian adventurer, known to be thoroughly unscrupulous, who had followed closely all Le Bon's experiments (who had received from him in fact, the most complete and the most confidential explanations) and who appropriated his discoveries and utilized them to his own ends.

Winzler translated into German Le Bon's technical memoirs, passed them off for his own and dedicated them to the Duke of Brunswick, in the hope of winning the patronage of that powerful Prussian. Failing in this, he went to England, changed his name to Winsor,

translated Le Bon's memoirs into English, again passing them off for his own, and repeated, with additions, Le Bon's experiments. A real business genius, he succeeded, by dint of persistent and ingenious advertising, in organizing and in obtaining a royal charter for the first gas company. This company still exists and lights a part of the city of London, but Winzler himself was eliminated therefrom early in 1815, by reason of his irresponsibility and incorrigible extravagance.

Returning to Paris, Winzler, alias Winsor, repeated there, with slight variations, the bluff which had succeeded in England, translating and palming off as his own Accum's "Treatise on Gas Lighting," and coolly presenting a demand for a patent (which, strangely enough, was speedily granted). A year or so later he lighted with gas, first a salon in the Passage des Panoramas, and then the Passage itself.

Le Bon's Widow Dies of Grief

In the meantime, Le Bon's widow, ruined financially by the rascality or unreliability of the persons who professed to espouse her late husband's interests—particularly parties who had faithfully promised to resume at Bercy the interrupted experiments of the Hôtel de Seignelay—discouraged by unavailing efforts to enlist the interest of the government authorities, and, above all, disillusioned by the necessity of her son's (who had been graduated from the Ecole Polytechnique in 1812 and upon whom she counted to continue his father's work) joining his regiment, died of grief, and Le Bon's patents expired and became public property.

The Early Gas Companies

Winzler's illumination of the Passage des Panoramas created the liveliest sensation and the Parisian public had had ample time to forget the illuminations of the Hôtel Seignelay. It was just the fillip needed to revive general interest in the subject of lighting by gas, and gas installations in private residences soon became quite the fashion. Furthermore, the Prefect of the Seine, then the Comte de Chabrol, who had known Philippe Le Bon and followed his experiments, cooperating with the Administration of the Hospitals and Public Charities, decided to create a veritable gas plant, based upon the system of Le Bon, in the Hospital Saint Louis. And in order that the experiment might be decisive, he entrusted the preparation and the realization of the affair to a commission of men reputed alike for their capacity and their prudence. There, the processes of fabrication and of utilization were steadily perfected, and the plant (extended in 1845 to include heating the wards and cooking the food) remained in active operation until 1860.

The installation of the Saint Louis plant may fairly be said to mark the effective beginning of the gas industry in France. Within a few years four other plants were operated by four gas companies, but it was not until 1829 (when gas lamps were set up in the Place Vendome and the Rue de Rivoli) that the new system inspired the public authorities with sufficient confidence to accept it for the lighting of the streets.

Triumphing Over Old Fogyism

The new illuminant, besides antagonizing like other inventions, deep-seated prejudice and offending the devotees of routine, injured or threatened to injure important vested interests. The pioneer companies had a correspondingly hard row to hoe. Not only did they have to combat the hostility of the fabricators of and dealers in candles and oil lamps,

but they had against them some of the most authoritative scientists of the period: Gay-Lussac, for instance, who affirmed that "if gas had been known first, the man who invented the candle and thus concentrated in a thimble all the mechanism of a gas plant would have been regarded as a peerless genius." The efforts of the companies furnished fruitful themes for the caricaturists and the composers of operettas and were the butt of the sarcasms of the professional wits of the boulevards and of the press (more particularly the brilliant chroniqueur, Charles Nodier) who had eyes only for the inconveniences of the innovation and exaggerated deliberately and maliciously the danger of the explosion of gasometers. Indeed, the opposition of these influences was so powerful and protracted that, during a considerable period, the majority of the gas companies regularly and promptly went into bankruptcy.

The Exposition

The International Gas Exposition was organized in the permanent structures at the entrance to the Jardin d'Acclimatation by the Technical Society of the Gas Industry in France ("Société Technique de l'Industrie du Gas en France"), of whose founding it also celebrated the semi-centennial. This institution, one of the functions of which is to conduct a summer school for gas engineers, designed to keep them in touch with the progress made in their specialty, collected, by subscription, more than a million francs for this purpose.

The exhibits are arranged in eminently logical divisions and subdivisions, of which I spare you the enumeration and description, but which give a clear and comprehensive conception of the scope and significance of the contemporaneous gas industry, and they are thus calculated to interest casual visitors no less than the technicians who have come from all over Europe for the express purpose of serious study.

Among the ingenious devices for visualizing the nature of the by-products of gas fabrication, is a block of coal weighing just a ton surrounded by the precise quantities of the different products resulting from its distillation. And the importance and the diversity of the industries engaged in the recuperation and the treatment of said by-products are further signalized in so vivid a manner as to constitute, for the uninitiated, a veritable revelation.

These industries supply agriculture with a constantly increasing quantity of artificial fertilizers; sanitary science, with powerful disinfectants; medicine, with efficacious remedies; metallurgy, with oils for fuel and for motors; the silk, cotton and woolen industries, with dyes; armies and navies with explosives and asphyxiating gases and the defences against them; highway departments, with paving material, preservatives for wooden paving-blocks and dust-laying mixtures; railroads, with preservatives for sleepers and briquettes for locomotives; builders, with roofings and paints; hardware dealers and jewelers, with a goodly portion of their stocks; artists, with colors; and housewives, with galvanized, enameled and aluminum ware, cleaning compounds and moth-killers. Besides, the manipulation of the by-products of gas plays a more or less direct role in the canning industry, the manufacture of internal combustion motors and automobile carburetors, the fabrication of glass for show windows, porcelains and glazed ware, the preparation of leather and tortoise shell goods, perfumes, flavoring extracts and certain pastries, laundering, the torrefaction of coffee and the moulding of the cylinders

that print the newspaper to go with the coffee.

There is a section (comprising maps, photographs, prints and paintings as well as battered objects) devoted especially to demonstrating the systematic destruction of the gas plants by the German armies of 1914-1918.

The Retrospective Exhibition

And there is a Retrospective Section, which reproduces graphically, in an appropriately decorated setting, the history of the first century of the gas epoch. This collection makes it easy for laymen to trace, step by step, the gradual amelioration of the material, the production, the storage, the distribution and the meterage of gas, as well as the apparatus for the utilization of its light, its heat and its motive power.

Here, for instance, are ancient wooden conduits in a remarkable state of preservation; a series of thirty-six gas meters, beginning with the Pauwels meter of 1825; a series of ten street lamps (including the improvisation of the period of bombardment) with the burners for public lighting employed in them; a series of one hundred and thirty domestic burners with the glass appurtenances that have been successively the fashion; and models of the earlier simple furnaces and ovens. And here are all sorts of precious relics (portraits, letters, manuscripts, drawings, certificates of patents, etc.) not only of Le Bon but of other pioneers; the Hollander Minckelers, the Englishman Murdock, the German Accum and the Austrian charlatan Winzler, alias Winsor—those pertaining to the last named being loaned by the library of the city of Birmingham.

Popular Attractions

The attention of the general public has been cleverly drawn to this highly educational exposition by a number of popular attractions: A movie show retracing minutely the successive operations of gas-making; a completely furnished and decorated apartment, showing all the applications of gas to domestic purposes; a pavilion where gas-fried fish and potatoes are served gratis; a panorama of the remote regions to which the French gas companies have extended their operations; a prize toy balloon contest, participated in by the Parisian theatrical and movie stars. And, above all, on the occasion of the visit of the President of the Republic, a minutely faithful reconstruction of the historic ascension of the Montgolfiére on the first of December, 1783. While the curious, gaily-colored counterfeit Montgolfiére, surrounded by an appropriately costumed guard, was being filled, an appropriately costumed band of itinerant minstrels rendered a number of quaint eighteenth century chansons. The immense sack rose majestically, and—striking coincidence!—was carried by the wind in precisely the same direction as the Montgolfiére of 1783, and passed directly over the town of Gonesse, where that balloon landed.

An International Congress

The prestige of the International Gas Exposition has been materially enhanced by an international congress, attended by important delegations from England, Belgium, Switzerland, Holland, Italy, Spain and Czechoslovakia. The first formal act of this congress was the dedication, with impressive ceremonies, of a tablet commemorating the pioneer gas plant of the Hospital Saint Louis.

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The House of a Hundred Comforts

The house which was opened to the public recently by the Philadelphia Suburban Gas & Electric Co., at Jenkintown, Pa.

The living room equipped with a gas fire place heater and auxiliary gas lights.

The kitchen with its modern gas range and equipment.

The bathroom with its gas wall heater.

The central house heating system—hot water—gas fired. This shows how the basement will look without a coal bin.

The laundry in basement, equipped with automatic gas water heater, gas heated mangle, gas heated dryer and auxiliary gas lights.

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About the Best Investment We Can Make

THE OTHER DAY when the mercury was hovering around the nineties and the Headquarters Staff was a little out of sorts, there came in the mails this letter from one of our Wisconsin member companies:

"We noticed that your A. G. A. advertisement Number 267 covers a letter which we wrote you some time ago asking for an advertisement that would deal with the wood competition we have to meet here. The note at the bottom of this advertisement, stating that it was gotten up at the request of a Wisconsin subscriber, leads us to believe that it is the advertisement we requested and we want to take this opportunity to thank you for your cooperation.

"We certainly appreciate the advantages the American Gas Association offers a small company like ours and we believe that our membership fee in the A. G. A. is about the best investment we can make."

It is surprising the effect that letter had on the weather. Everyone seemed to feel a little cooler, notwithstanding the Weather Bureau's official report that the day's temperature struck a new high point.

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MANUFACTURERS SECTION

G. W. PARKER, Chairman — E. E. BASQUIN, Vice-Chairman

C. W. BERGHORN, Jr., Secretary

MANAGING COMMITTEE—1924

AARON, C. T., Boston, Mass.
ABBOTT, M. E., Taunton, Mass. (Gas Sales of N. E.)
BARTLETT, C. E., Philadelphia, Pa. (New Jersey)
CRANE, W. M., New York, N. Y.
DEHART, J. S., Jr., Newark, N. J.
FAIRCHILD, S. E., Jr., Ambler, Pa.
FOWLER, W. M., Philadelphia, Pa.
GRADY, S., Philadelphia, Pa. (Pennsylvania)
GREENE, J. J., New York, N. Y.
HOBBS, G., Toronto, Ont., Canada. (Canadian)
KING, T., Pittsburgh, Pa.
MCCULLOUGH, CHARLES, Milwaukee, Wis. (Wisconsin)
MCDONALD, DONALD, New York, N. Y.
MCILHENNY, J. D., Jr., Philadelphia, Pa.
NORMAN, E. A., New York, N. Y.
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PARKER, JOHN F., Rockford, Ill. (Indiana)
RAMSBURG, C. J., Pittsburgh, Pa.
ROPER, G. D., Rockford, Ill. (Illinois and Iowa)
SEIDENGLANZ, C. H., Pittsburgh, Pa. (Southwestern)
SMITH, W. L., Battle Creek, Mich. (Michigan)
STITES, TOWNSEND, Gloucester, N. J.
STOCKSTROM, A., St. Louis, Mo. (Missouri)
WHETSTONE, W., Philadelphia, Pa.
WILSON, H. A., Newark, N. J.
WOLFE, A. McW., Baltimore, Md. (Southern)

CHAIRMEN OF SECTIONAL COMMITTEES ORGANIZED TO DATE

Exhibition—GEO. W. PARKER, St. Louis, Mo.
Nominating—F. A. LEMKE, Kalamazoo, Mich.
Division of Accessories Manufacturers—H. A. WILSON, Newark, N. J.
Division of Apparatus & Works Manufacturers—S. F. FAIRCHILD, Ambler, Pa.
Division of Gas Range Manufacturers—CHAS. T. AARON, Boston, Mass.
Division of Heating Appliance Manufacturers—THOMSON KING, Pittsburgh, Pa.
Division of Industrial Appliance Manufacturers—WALTER WHETSTONE, Philadelphia, Pa.
Division of Lighting Appliance Manufacturers—TOWNSEND STITES, Gloucester, N. J.
Division of Meter Manufacturers—J. D. MCILHENNY, Jr., Philadelphia, Pa.
Division of Office Labor Saving Devices—E. A. NORMAN, New York, N. Y.
Division of Water Heater Manufacturers—W. M. FOWLER, Philadelphia, Pa.
Division of Supply Manufacturers—J. J. GREENE, New York, N. Y.

Shipping Containers

Government laboratory offers services in proper design of boxes and crates for the industry.

C. A. PLASKETT, Engineer in Forest Products, U. S. Forest Products Laboratory, Madison, Wis.

THE DESIGN of any shipping crate or case is a piece of engineering. The good mechanical design and construction going into an expensive heater or range is too often nullified by poor engineering in the shipping room, with the result that after the usual amount of rough handling on the way the dealer gets the goods in an unsalable condition; delays result, goodwill suffers, and actual losses must be made good.

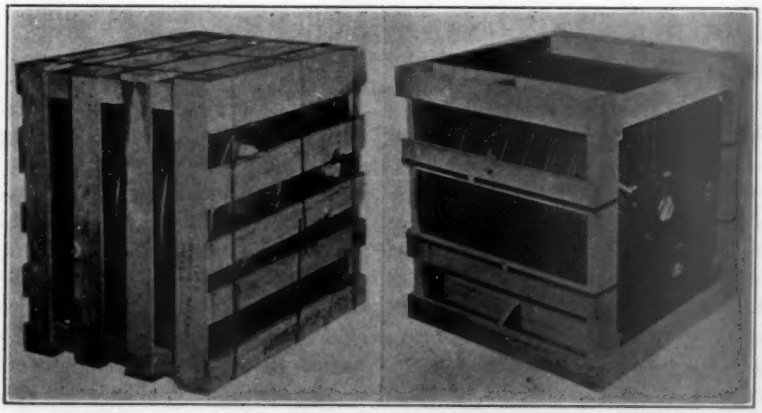
During the last few years great efforts have been made by manufacturers, shippers, transportation agencies and others to reduce the enormous loss and damage incurred by freight in transit and to obtain greater all-round economy in shipments. Investigations have shown that improvement in the design and specifications of the shipping containers as well as improvement in the methods of packing are among the most important factors affecting this economy. In addition to the enormous loss to both the consignee and shipper chargeable to goods lost or damaged in transit, the shipping of poorly packed goods involves a big risk of loss or damage against which the railroads must protect themselves by high freight rates. Again a large amount of freight charges is paid on containers which are too heavy or of too great volume. Goods packed so that they may be delivered without loss or damage in containers of

minimum weight and volume exert a far-reaching effect not only in reducing freight charges and other distribution costs, but also in establishing the good will of the customer.

In the attempt to solve packing problems, too little attention has been given to the engineering feature of container design and methods of packing. Properly to design any engineering structure requires first of all a knowledge of the properties of the materials, the requirements of the structure, and the character of the stresses. In addition, a knowledge is necessary of the details of construction, methods of manufacture or construction and their effect on costs, availability and costs of materials, and the system of loading. Boxes and crates must be designed to perform a definite service, the same as a freight car, a building, a bridge, a highway, or a machine. Shipping containers may be constructed of wood, fiber board, metal, or combinations of these or other materials and used for the shipment of a wide variety of products. Nevertheless the principles underlying their performance are subject to analysis, and the chief sources of damage and actual loss can be controlled.

If the contents are not properly supported, a container, even though of very heavy construction, may prove insufficiently strong, whereas a lighter container with less strength may prove satisfactory if the contents are packed so as to bring the stresses to the parts of the container best able to withstand them. A piece of furniture or a gas range, which cannot be distorted without injury, must be packed in a properly braced container and supported at the right points. Yet it is a great waste to crate too solidly.

Again, the proper design of containers varies considerably with transportation conditions. Export shipments require



The crate on the left was used by a manufacturer of steel pulleys for export shipment. The crate on the right is an improved type designed for the shipper by the Forest Products Laboratory. Each crate carries a load of four 36" and twelve 8" pulleys.

The improved crate occupies a trifle less shipping space than the older one. It requires 13.5% less lumber for its construction, 33⅓% less strapping, weighs 5% less, and shows much greater resistance to rough handling. One drop in the large box tumbling drum was sufficient to bring about the failure of the original crate. The improved crate withstood 100 drops in the same drum.

A group of manufacturers watching a test of fiber boxes packed with their product.

stronger containers and more protection than domestic shipments; rail or coastwise shipments require stronger containers than shipments by motor truck; while car-lot shipments, if properly loaded by the shipper and unloaded by the consignee, may be made sometimes without any container.

How Laboratory Results Can Help

Owing to the impossibility of determining offhand the kind and amount of rough handling the containers must withstand or the actual distribution of stress in the container, there is an increasing tendency to base the design and specifications upon the results of tests of containers packed with the actual or similar products.

Because of its special box-testing equipment, supplemented by its research functions in the properties and uses of wood and wood products, the U. S. Forest Products Laboratory at Madison, Wis., is well fitted to conduct investigations of the economical design of shipping containers and assist manufacturers and shippers in the solution of their particular packing problems.

The advantages and limitations of different types of containers and the influence of various construction details on their strength and serviceability are studied by means of various tests which simulate actual shipping conditions. The Forest Products Laboratory designed and installed the first tumbling drum for boxes known in this country or abroad. After about 3 years' service it was supplemented, in 1918, with a larger drum, 14 feet in diameter, in which loaded boxes are dropped and shifted by a series of baffles imparting a variety of movements and shocks. Another machine imitates the "weaving" effect of a car in rapid motion and also the starting or stopping of the car. Tests are conducted representing the pressures to which pack-

ages are subjected when stacked in warehouses. The static strength characteristics of containers and their parts are tested under various conditions of loading.

The laboratory conducts numerous investigations on such problems as the seasoning of lumber, identifications and structure of wood, preservative treatments of wood, glues and problems connected with their use, manufacturing methods and suitability of various woods for pulp, paper, and special products, chemical properties and uses of wood and chemical wood products, etc. The laboratory is constantly engaged in tests to determine the physical and mechanical properties of various species of woods, the factors influencing their strength, and the efficiency of various types of nailed, cleated, and glued joints and fastenings. Each of these studies furnishes information of more or less direct bearing on the shipping container problems.

Shippers are naturally very much interested in the application of the acquired data to the solution of their particular packing problems. The laboratory has cooperated with several hundred manufacturers and shippers in developing more efficient containers, with some very gratifying results. The same kind of service is available to other groups of manufacturers and shippers upon guarantee of the actual cost of the investigation. While the work can be handled for individuals, it is usually more economical to arrange a special course of demonstrations and instruction at the laboratory for groups of manufacturers having related problems.

The manufacturer usually has first-hand knowledge of the transportation conditions for his particular commodity

A recent Forest Products Laboratory class in boxing and crating observing test of crate on vibrating machine.

and the nature of the damage. The laboratory through all its studies has developed the fundamentals of container design to meet these varying conditions. While there are undoubtedly a large number of factors to be considered, a systematic study of container design divides itself broadly under three heads: first, a study of the properties of the materials; second, a study of the advantages and limitations of different types and designs of containers; and third, a study of methods of packing. The fundamental principles are not so very numerous after all, but it is essential that the designer know their relative importance in the solution of his problems. A thorough study of the shipping requirements of different commodities will reveal that the same general principles apply to the packing of a surprisingly large number of widely different products. It is the purpose of the laboratory in its crating courses to inculcate a clear understanding of these principles and demonstrate the circumstances under which they apply. As nearly as can be arranged, the commodities shipped by the concerns represented in the class are used for demonstrations. When such procedure is not possible the variations in detail necessary to apply the principles to individual commodities are discussed. The student is generally able to apply the principles to his particular problems, and as a rule he can bring about material improvement in faulty containers and methods of packing, with a reduction in cost.

It is not expected, however, that one having attended one of these courses will be able to design a perfect container. In fact, such a container has not yet been designed; but improvements have been made, and it is still possible in the industries for those in charge of the packing to make decided betterments once their attention is fixed upon the principles of proper construction and the fault in design and packing as revealed in the character of the damage. The special courses which have been given during the past 5 years have proved to be the most effective way of disseminating the information. The preparation of the exact type of containers for the line of commodities studied is an added advantage of the special course.

The Forest Products Laboratory as a governmental agency is offering its services for the reason that better engineering in container design will result in more economical use of our dwindling timber supply, and especially in view of the fact that the container industry is the second largest consumer of lumber in the country, using 4½ billion board feet annually.

There can be no question of the value of such a study, especially to our manufacturer members. Nor need the cost be prohibitive. The Laboratory advises us that the expense for fifteen or twenty representatives, exclusive of travel and subsistence, need not exceed $2500. (EDITOR'S NOTE.)

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New Exhibitors

Since the publication of the last Monthly, the following additional exhibitors have been allotted space as indicated:

	Booth No.
Ash Reclaiming Machinery Corp., New York, N. Y.	79A
Commercial Section, Home Service Bureau	218, 219, 220
Commercial Section, Window Display	Stage, Small Ballroom
Con-Den-Rit Radiant Log Corp., The, Perth Amboy, N. J.	176
Republic Flow Meters Co., Chicago, Ill.	188
Robins Conveying Belt Co., New York, N. Y.	173
Vesta Gas Range & Manufacturing Co., Chattanooga, Tenn.	172
Wood & Co., R. D., Philadelphia, Pa.	216, 217

A. G. A. Members to Exhibit at Society of Steel Treating Convention

At the coming Convention of the American Society for Steel Treating, Copley Plaza Hotel, Boston, Mass., Sept. 22 to 26, Mr. H. O. Loebell of the Combustion Utilities Company, will deliver a paper at the Tuesday afternoon session, Sept. 23, on "Gas as a Factor in Improving Quality Standards and Lowering Production Costs of Heat Treated Steel."

Among the companies which will have exhibits are the following company members of the A. G. A.: American Gas Furnace Company, Armstrong Cork & Insulation Company, Bristol Company, Combustion Utilities Corporation, King Refractories Company, Inc., Leeds & Northrup Company, Republic Flow Meters Company, Surface Combustion Company and the A. H. Wolff Gas Radiator Company.

Highlights of America's Gas Industry

This is the title of a sixteen-page pamphlet reprint of an article published recently in the Boston Transcript from data supplied by the Association.

The pamphlet contains the most up-to-date information obtainable on the manufactured gas industry and is invaluable for lecture purposes and for distribution to security holders and employees.

Sample copies will be mailed free upon request. The pamphlet sells for four cents up to one thousand copies and three and one half cents a copy for quantities up to five thousand. On larger orders special prices can be had.

INDUSTRIAL GAS SECTION

H. H. CLARK, Chairman — H. O. LOEBELL, Vice-Chairman

C. W. BERGHORN, Jr., Secretary

MANAGING COMMITTEE—1924

ALLINGTON, J. B., Rochester, N. Y.
ANDREW, H. O., New York, N. Y.
BROUGHTON, H. E., Jackson, Mich. (Michigan)
CAULEY, F. F., Chicago, Ill.
CLARK, H. H., Chicago, Ill. (Illinois)
CRAWFORD, H. M., San Francisco, Cal.
DE CORIOLIS, E. G., Boston, Mass.
GALBRAITH, L. F., Oakland, Cal. (Pacific Coast)
HARDING, D. J., York, Pa. (Pennsylvania)
HENRY, H. M., Pittsburgh, Pa.
HEPBURN, W. M., New York, N. Y.
HOLMAN, H. B., St. Louis, Mo.
KELLY, T. J., Fort Wayne, Ind. (Indiana)
KRAUSSE, C. C., Baltimore, Md.
LAPORE, P. J., Boston, Mass.
LEINROTH, J. P., Newark, N. J.
OSTERMAN, P. C., Elizabeth, N. J.
QUINN, J. J., Quincy, Mass. (N. E. Gas Eng.)
RAMSAY, R. E., Philadelphia, Pa.
RASCH, W. T., New York, N. Y.
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SELLMAN, N. T., New York, N. Y.
SLIMPIN, C. D., Montreal, Can. (Canadian)
STAHL, C. R., Davenport, Ia. (Iowa)
STEPHANY, E. J., Pittsburgh, Pa.
THOMPSON, W. D., Hammond, Ind.
VITTINGHOFF, H., Boston, Mass.
WATSON, H. E. G., Toronto, Can.
YEATON, G. D., Providence, R. I. (Gas Sales of N. E.)
YOUNG, A. W., Knoxville, Tenn. (Southern)
YOUNG, R. R., Newark, N. J. (New Jersey)

CHAIRMEN OF SECTIONAL COMMITTEES ORGANIZED TO DATE

Convention Program—F. F. CAULEY, Chicago, Ill.
Cooperation with "Industrial Gas"—N. T. SELLMAN, New York, N. Y.
Educational—R. R. YOUNG, Newark, N. J.
Industrial Booklets—
Combustion—H. O. LOEBELL, New York, N. Y.
Hotel & Restaurant Uses—J. P. LEINROTH, Newark, N. J.
House Heating—E. D. MILENER, Baltimore, Md.
Large Volume Water Heating—W. T. RASCH, New York, N. Y.
Steam Boilers—H. VITTINGHOFF, Boston, Mass.
Wholesale Baking—H. M. HENRY, Pittsburgh, Pa.
1000 Uses for Gas—H. H. CLARK, Chicago, Ill.
Ceramics—C. C. KRAUSSE, Baltimore, Md.
Drying—J. ZANDOR, Chicago, Ill.
Food Products—E. J. STEPHANY, Pittsburgh, Pa.
Forging & Heat Treating—W. D. THOMPSON, Hammond, Ind.
Soft Metal Melting—W. M. HEPBURN, New York, N. Y.
Tank Heating—OSCAR BOWEN, Chicago, Ill.
Nominating—F. F. CAULEY, Chicago, Ill.

Househeating—The First Industrial Book

OUR MANUFACTURER COMPANY members were recently advised by letter that the book on House Heating, the first of a series of industrial booklets to be published by the American Gas Association, would be ready for sale by August 1.

Provision has been made in the back of the book for the addition of loose catalogue sheets to be furnished by the manufacturer to the purchasers of the book and the specifications of these sheets are illustrated herewith.

Up to the time of going to press we have received orders from the following and in the quantities indicated:

Name and Address	Number of Copies
C. E. Reese, Bluefield Gas & Power Co., Bluefield, W. Va.	1
M. A. Combs, 115 Belmont Avenue, Jersey City, N. J.	1
A. I. Phillips, 50 Church St., New York, N. Y.	1
W. H. Tappan, The Tappan Stove Co., Mansfield, Ohio	1
H. Leigh Whitelaw, Gen. Mgr., The A. H. Wolff Gas Radiator Co., 376 Lafayette St., New York, N. Y.	1
Thomson King, Peerless Heater Co., Pittsburgh, Pa.	1
Editor—"Architecture" Chas. Scribner's Sons, 597—5th Avenue, New York, N. Y.	1
Editor—"Architectural Forum" 383 Madison Avenue, New York, N. Y.	1
F. C. Houghton, Secy., Amer. Soc. of Heat. and Vent. Engrs., 29 West 39th St., New York, N. Y.	1

HOUSE-HEATING
Industrial Gas Series

SPECIFICATIONS FOR LOOSE LEAF SHEETS FOR HOUSE-HEATING BOOK

1. Paper	Do not exceed in weight paper of sheet size 25 x 38 (50 pounds per ream). Use any color or kind of paper desired.
2. Printing	Confine type limits to size 6 x 9" as indicated by rule border on this sheet. Use any color or colors of ink desired. *Note*—Print box appearing in upper right hand corner as indicated for identification. The reverse side of sheet can also be utilized, and when doing so, print with holes at the bottom to conform with method of opening this section.
3. Punching	Punch all sheets with two (2) ¼" round holes, 3" center to center, as indicated on this sheet.
4. Shipping	In shipping, these sheets should *not be folded* as they are to become permanent pages in the book.

Specifications of Catalogue Sheets.

E. D. Milener, 1
Consolidated Gas, Elec. Lt. & Pr. Co.,
Baltimore, Md.

H. Behrman, 1
Brooklyn Union Gas Co.,
Brooklyn, N. Y.

The Cleveland Heater Co., 1
Cleveland, Ohio.

Wm. M. Crane, Pres., 1
Wm. M. Crane Co.,
New York, N. Y.
18-20 East 41st St.,

D. L. Sedgwick, Gas Operating Engr., 1
Illinois Power & Light Corp.,
Illinois Merchants Bank Bldg.,
Chicago, Ill.

Walter Whetstone, Pres., 10
Southern Gas & Power Corp.,
940 North Front St.,
Philadelphia, Pa.

Western Gas Construction Co., 1
Ft. Wayne, Ind.

John L. Mather, Mgr., 1
The Counties Gas & Electric Co.,
Ardmore, Pa.

Geo. R. Trumbull, 1
General Engr. & Management Corp.,
165 Broadway,
New York, N. Y.

Edward Stephenson, Indus. Fuel Engr., 1
The Danbury & Bethel Gas & Elec.
Lt. Co.,
Danbury, Conn.

W. I. Cobb, Comptroller, 1
The Peoples Gas Light & Coke Co.,
122 South Michigan Avenue,
Chicago, Ill.

Cyrus Barnes, Gen. Sales Manager, 1
Chas. H. Tenney & Co.,
200 Devonshire St.,
Boston, Mass.

T. P. Pinckard, Pres., 1
Windsor Gas Co., Ltd.,
Windsor, Ontario, Canada.

Chas. A. Lass, Gas Engr., 1
Birmingham Electric Co.,
Birmingham, Ala.

C. R. Henderson, Supt., 1
Washtenaw Gas Co.,
Ann Arbor, Mich.

V. M. F. Tallman, Power Engineer, 1
Chas. H. Tenney & Co.,
200 Devonshire St.,
Boston, Mass.

Rosco Nettles, Mgr., 1
The Tampa Gas Co.,
Tampa, Florida.

G. H. Cadera, 1
Cribben & Sexton Co.,
Chicago, Ill.

W. G. Haskell, Jr., Mgr., 1
Johnson Gas Appliance Co.,
Cedar Rapids, Ia.

L. B. Young, Gen. Mgr., 1
The Michigan Stove Co.,
Detroit, Mich.

F. H. Knapp, Pres., 1
Pittsburg Water Heater Co.,
Pittsburgh, Pa.

Alliance & Dublin Consumers Gas Co., 1
10 Hawkins St.,
Dublin, Ireland.

E. C. Kolack, 1
Georgia Railway & Power Co.,
Atlanta, Ga.

W. M. Henderson, 1
Pacific Coast Gas Assn.,
812 Howard St.,
San Francisco, Calif.

Reference Department, 1
Illinois Power & Light Corp.,
Illinois Merchants Bank Bldg.,
Chicago, Ill.

Mr. J. J. Foot, 1
The McClary Manufacturing Co.,
London, Ontario, Canada.

Consolidated Gas, Elec. Lt. & Pr. Co., 1
552 Lexington Bldg.,
Lexington & Liberty Sts.,
Baltimore, Md.

Mr. J. F. Reynolds, 1
Consolidated Gas Company of N. Y.,
130 East 15th St.,
New York, N. Y.

Purchasing Dept., 3
Providence Gas Company,
Turks Head Bldg.,
Providence, R. I.

Mr. Chas. W. Taggart, Gen. Mgr., 1
The City of Norwich Gas and Elec. Dept.,
Norwich, Conn.

Mr. A. J. Smith, 4
Concord Gas Company,
Concord, N. H.

The Roberts Brass Mfg. Co., 1
5435 Fort Street, West,
Detroit, Michigan

Mr. Walter Beckjord, 1
American Light & Traction Co.,
120 Broadway,
New York, N. Y.

Mr. F. W. Stone, 2
The Ashtabula Gas Company,
Ashtabula, Ohio

Those manufacturers who advise headquarters that they wish to supply the purchasers of the book with catalogue sheets will be kept informed from time to time of its distribution.

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Middle West Utilities Company Announces Changes in Executive Personnel

Following a meeting of the Board of Directors of the Middle West Utilities Company, the election of Mr. Martin J. Insull as President of the Company was announced.

At this same meeting Mr. Samuel Insull was made Chairman of the Board and the following new Vice-Presidents were elected: Mr. E. V. Graham, in charge of the sale of securities; Mr. W. C. Sharp, in charge of operations; Mr. George W. Hamilton, in charge of hydraulic and electrical engineering; Mr. A. J. Authenreith, in charge of artificial ice engineering. Mr. John F. Gilchrist, who has been a Vive-President of the Company, will continue in that capacity.

Gas in a Large Manufacturing Plant

The three views shown are of some of the gas appliances in use in the manufacture of sylphon specialties. The total gas consumption in this plant is about 1,300,000 cu. ft. per month.

The japanning room with gas ovens.

The blacksmith shop—tempering and hardening furnaces.

The annealing room with gas fired annealing furnaces.

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Gas Lecture to be Issued in Revised Form

A revised edition of the lecture manuscript entitled, "The Story of Gas—Illustrated with Seventy-Two Lantern Slides," will be available for use by members of the Association at an early date. The new title of the lecture will be, "A Short Talk on the Manufactured Gas Industry."

The difference between the revised edition and the old will be the omission of lantern slides and all references to them in the manuscript. It was found necessary to take this step because of the large expense involved in keeping the slides in repair. In addition the slides showed apparatus, plant equipment and installations of such a large character that they were of little interest to local audiences outside New York.

The Association recommends that all companies using the lecture method in their public relations work should have their own slides and use these in connection with data supplied by the headquarters staff.

Industrial Gas in Schools

The following comes to us from the Consumers Gas Company of Toronto, Canada, and is an example of splendid educational work. (EDITOR'S NOTE.)

TORONTO IS STRONG on technical education. Riverdale Technical School, the latest addition to this branch of educational work, has been erected in the east end of the city. The school was built to relieve the congestion in the Central Technical School. Training given in the new school is most up-to-date and a complete course in metal working and carpentry is available.

Mr. R. V. Lonsdale, of the Industrial Department of the Consumers' Gas Company of Toronto, was successful in placing in the school the under noted equipment:

Appliance	*Dept. Installed In*
1 Oven Furnace	Machine Shop & Tool Making Division
1 Large Bench Forge	Machine Shop & Tool Making Division
3 Small Bench Forges	Machine Shop & Tool Making Division
17 Small Soft Metal Furnaces	Plumbing & Electric Battery Division
1 Soft Metal Furnace (530 lbs. capacity)	Foundry Division
1 Core Drying Oven	Foundry Division
2 Soldering Iron Furnaces	Tinsmithing Division
1 Small Soft Metal Furnace	Tinsmithing Division
1 Small Soft Metal Furnace	Automotive Shop
25 Bunsen Burners	Chemical Laboratories
1 Cabinet Gas Range	Domestic Science Division
48 Domestic Science Hot Plates	Domestic Science Division

Hardening furnace and bench forges.

COMMERCIAL SECTION

J. E. DAVIES, Chairman — J. P. HANLAN, Vice-Chairman

LOUIS STOTZ, Secretary

MANAGING COMMITTEE—1924

BALL, FRANK L., Fitchburg, Mass.
BRILL, A. P., Pittsburgh, Pa.
BURKE, E. J., Indianapolis, Ind. (Indiana)
BURNS, J. J., St. Louis, Mo.
CANNIFF, R. J., Poughkeepsie, N. Y.
CANTRELL, NORMAN, Chicago, Ill.
COBB, WILEY F., St. Louis, Mo. (Missouri)
CRAFTS, H. C., Pittsfield, Mass. (N. E. Gas Eng.)
CRANESHAW, J. W., Allentown, Pa. (Pennsylvania)
CURTIS, C. C., Fall River, Mass.
DAILY, E. V., Chicago, Ill.
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DOERING, H. A., Mt. Vernon, N. Y. (Empire State G. & E.)
FUGATE, F. S., Detroit, Mich. (Michigan)
GALBRAITH, L. F., Oakland, Calif. (Pacific Coast)
JOHNSON, W. B., Toronto, Can. (Canadian)
JONES, JACOB B., Bridgeton, N. J. (New Jersey)
KARSHNER, G. M., New York, N. Y.
KENNEDY, T. F., New York, N. Y.
KING, THOMSON, Pittsburgh, Pa.
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McCONNELL, H. N., New York, N. Y.
PICKARD, B. F., Greensboro, N. C. (Southern)
PHENICIE, C. R., Green Bay, Wis. (Wisconsin)
QUINN, JOHN J., Quincy, Mass. (Gas Sales of N. E.)
RASCH, W. T., New York, N. Y.
SMITH, D. R., Baltimore, Md.
SMITH, W. L., Battle Creek, Mich.
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WEISER, J. A., York, Pa.

CHAIRMEN OF SECTIONAL COMMITTEES ORGANIZED TO DATE

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Commercial Policy—P. S. YOUNG, Newark, N. J.; CHAS. A. MUNROE, Chicago, Ill.; F. J. RUTLEDGE, Philadelphia, Pa.; R. B. BROWN, Milwaukee, Wis.; F. R. BARNITZ, New York, N. Y.
Home Service—ADA BESSIE SWANN, Newark, N. J.
Salesman's Manual—H. D. VALENTINE, Chicago, Ill.
Sales Stimulation—J. P. HANLAN, Newark, N. J.

The Result of the Millbrook Summer Sales Conference

Over seventy-five members and guests participated in the Summer Sales Conference at Millbrook Inn, Millbrook, New York, during the week of August 3rd to 9th.

Every one fortunate enough to be there expressed a hope that such a conference would be repeated next year. There was a hundred per cent attendance at each of the business sessions. These meetings lasted from ten o'clock till one, Monday to Friday, inclusive. The program covered a wide range of interesting subjects; the discussions were intensely interesting and were entered into by nearly every one present.

One noticeable feature throughout the week were the small group meetings scattered around the grounds of the Inn, on the porches, in the lobby and elsewhere, of intensely interested men, who found in this a wonderful opportunity for new friendships and intimate discussion of sale problems.

Expressions were heard on every side that the Conference was the best meeting that they had ever attended and the feeling was that the Conference idea should be an annual affair.

A full stenographic report of the entire meeting was taken. This will be edited and published and each one who attended the Conference will receive a copy. Undoubtedly, many men in our membership will want a copy of the Proceedings of this first Conference. If so, they will be available within a few weeks at the cost of printing. Anyone wishing a copy please communicate with Association Headquarters.

The address of welcome was delivered by Mr. T. R. Beal, President of the Central Hudson Gas & Electric System, the response being made by Major Alexander Forward, Secretary-Manager of the Association, after which the meeting immediately took up the various subjects on the program which included,—

August		
Monday—4	Effective Direct Advertising and House Organs	R. E. Ramsay, Vice-President, James F. Newcomb & Co., Inc., New York, N. Y.
	New Business Development and Sales Stimulation	R. J. Canniff, Sales Promotion Dept., Central Hudson Gas & Electric Co., Poughkeepsie, N. Y.
Tuesday—5	Newspaper Space and Its Proper Use	T. H. Moore, Associate Director, Bureau of Advertising, American Newspaper Publishers Association, New York, N. Y.
	Effective Displays for Windows and Showrooms	Morris L. Beard, and Robt. L. Ware, Colgate & Company, New York, N. Y.
Wednesday—6	Selling the Consumer Direct	E. H. Kauffman, Educational Director, Fuller Brush Company, Hartford, Conn.
Thursday—7	A New Note in Business Administration	Dr. Lee Galloway, Ronald Press, New York, N. Y.
	Home Service	Miss Ada Bessie Swann, Public Service Gas Company, Newark, N. J.
Friday—8	Gas Trade Cooperation—Architects, Builders, Plumbers, etc.	W. A. Adams, Manager, Architects' & Builders' Service Section, The Peoples Gas Light & Coke Co., Chicago, Ill.
	Customer Ownership	Percy Whiting, Henry L. Doherty & Company, New York, N. Y.
	The Making of Industrial Surveys	H. M. Henry, Combustion Utilities Corporation, New York, N. Y.

Open Discussion of Queries from Question Box

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Winchester's "Organized Kitchen" Window.

Gas Company Exhibits at Industrial Exposition

THE BROOKLYN UNION Gas Company exhibited gas appliances for use in the factory, restaurant and home, at the recent Brooklyn Industrial Exposition held in the 23rd Regiment Armory, Brooklyn, N. Y., April 5th to 12th, 1924. This was the third annual exposition held under the auspices of the Brooklyn Chamber of Commerce and was attended by approximately 100,000 people.

There were 150 exhibitors, comprised mostly of manufacturing concerns located in Brooklyn.

The Brooklyn Union Gas Company occupied six booths with a total floor space of 960 sq. ft., the space being divided into five major sections displaying:

Metal appliances
Miscellaneous food appliances
Hotel and restaurant appliances
Steam boilers and house heating appliances
Domestic gas appliances

The booths were located in a prominent position on the central aisle, just to the right of the main entrance and the live gas exhibits attracted much attention.

The Metal Section displayed a high pressure gas system in operation supplying a rod end forge, a cleaning tank and a radiant refractory bed. There was also on exhibit an indirect oven, soft metal furnace, crucible furnace, numerous small appliances and the latest types of automatic controls.

One view of the exhibit.

Another view of the exhibit.

The Miscellaneous Food Group had an actual demonstration of pastry baking by a master baker, supplied by the courtesy of the Combustion Utilities Corporation. Samples were distributed to visitors at the booth. Besides the portable bake ovens, there were displayed various models of confectionery stoves.

Another display which aroused general interest was an underfired surface combustion burner.

The Hotel and Restaurant Section showed a complete line of restaurant ranges with salamanders and shelves, broilers, griddles and water heaters.

The Steam and House Heating Section had an automatic steam boiler and storage water heater in operation. In addition, various sizes and makes of boilers were shown together with a gas steam radiator, garage heater and an automatic steam trap.

The housewives and high school girls attending the show centered much of their interest on the many types of gas ranges suitable for up-to-date cookery, shown in the domestic display, as well as the water heaters used for culinary household water heating. Attractive floor and table lamps, room heaters of the portable and stationary type, were also displayed.

Notice

The Home Service Committee has arranged to use spaces 218—219—220 on the Steel Pier during our Atlantic City Convention in October for an exhibit of the Home Service activities of our member companies. There is a growing interest on the part of gas companies in this work and all those who attend the convention are urged to make a careful inspection of this particular display.

TECHNICAL SECTION

L. J. WILLIEN, Chairman — GEO. H. WARING, Vice-Chairman

H. W. HARTMAN, Secretary

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CHAIRMEN OF SECTIONAL COMMITTEES ORGANIZED TO DATE

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Selection, Preparation and Carbonization of Coal and Preparation of Coke

PART II

A. W. GRANT, JR., St. Paul, Minn.

NUMEROUS METHODS for determining the coking index of coals have been proposed. The original one probably was Compredon's sand test. It appears, however, that carbon flour gives better results than does sand, which chemically and especially physically is dissimilar to either fixed carbon or ash. Thus, for the purpose of throwing light on this aspect of the subject, I once had some tests made to show the relative agglutinating value of a binder when carbon flour was used as one inert material and pulverized roofing slate of the same degree of fineness, the other. It is well known that low temperature carbonization produces coke that is friable in character, which characteristic may be partially attributed to the large yield of tar and low yield of gas. Remembering also, that the matter of heat supplied during carbonization is an important factor influencing the character of coke produced, it was decided to employ dehydrated coal tar as the binder in the tests mentioned above. These showed that coal tar has a much lower agglutinating value than either the coal from which it was produced, or pitch; and that equal agglutinating values were obtained for carbon flour and for slate. These findings I believe to be truly comparable to large scale practice, with the one exception that any given percentage of ash will reduce the agglutinating value of a binder somewhat more than will a like percentage of fixed carbon.

In any event, I believe that an agglutinating test of the nature of Compredon's for coals fails to give a true indication of the coking index because of the agglutinant material indicated by such a test more is obtained directly from the tar than where the same coal is carbonized in a commercial chamber. It is, however, an easy, practical test that can be made in short time and indicates fairly closely the character of coal dealt with.

In summing up these data, it is apparent that either a surplus or a deficit of cementing material will produce friable coke; the former is analogous to sponge coke; the latter, to coke manufactured from a high-ash or high-oxygen western coal. It becomes, therefore, a problem for the operator of each individual plant to work out the agglutinating value for the particular character of coke (density, locular structure, etc., considered) that best meets its trade requirements, without unduly burdening the cost of gas per thousand.

Coke Degradation

A study of these points will indicate a trend that is too little considered in many gas, and some coke plants; still less understood by most coal companies: that of coke degradation. The yield of sized coke can be maintained at a maximum only when the coking mixture is "in balance"—factors of heating, quenching and handling remaining constant.

Of course, a surplus of cementing material tends toward more porous and friable coke; not alone more friable because of the greater porosity, but because the greater moisture content of coke possessing high porosity detracts from its strength.

Besides these, there is still another angle from which to consider coke degradation. It is somewhat speculative but worthy of much reflection. If the question of coke size does not hold paramount position, and that of total plant degradation governs, it may be wise to forfeit coke size and a small amount of surplus gas in order to bring about increased degradation within the carbonizing chamber (that is, primary degradation) by means of higher final temperatures. For such conditions, an increase in primary degradation and increase in the fuel gas consumption may be more than offset by the attendant advantages of a tougher coke and the subsequent reduction in "secondary" (during handling and screening) and stock pile degradations, especially so if the coke output has to undergo crushing.

Heating

As heat is applied to the coal mixture, it will undergo the formation of coke and the qualities of this major product are proportional, in a large measure, to the amount of heat applied. There is, moreover, an optimum rate of supplying heat which, if ignored, will lead to inferior qualities in coke produced.

High temperature coke made in narrow carbonizing chambers is more combustible than lower temperature coke produced in wider chambers because of the rapid evolution of gas and quick "setting" of the residue, which makes the former more porous while the rapid passage of gas does not allow, to the same extent, of the "breaking down" of tar and hydrocarbons, which add to the density of the coke. Also, the latter coke receives increased depositions of "transmuted" or vitreous carbon because of the longer time of contact between the volatile hydrocarbons and coke. Decomposition of gases is facilitated by interposing solids in their passage of flow.

High temperature carbonization, therefore, permits the carbonizing of a greater range of low grade coals. This is possible both because of the more rapid speeding away of oxygenated compounds as well as the accelerated advance of temperature gradients. These conditions accentuate the rate of decomposition and "fixing" of cementing materials and thus allow a portion of such materials to assist in the formation of low temperature coke rather than to allow them to become degraded by remaining too long in contact with hot surfaces.

For obtaining the best results uniform heating is essential, not only between wall and center of the charge, nor from top to bottom, but as well to maintain commensurate heat supplies at narrower and wider portions of the charge. In the case of older types of ovens, which reverse the fuel gas from pusher side to coke side and vice versa, this can better be accomplished by properly proportioning the respective time intervals than by fuel gas rates, otherwise it becomes a singular problem.

Indices of Coke Comparison

Neither the porosity, size, true or apparent specific gravity, nor combustibility are individually competent gauges of the merit of a coke. The mere matter of combustibility that has induced such popular discussion for several years must, in a measure, give way to, or for practical purposes be modified by, the influence of the weight of combustible matter per unit of coal volume (i.e., at least for certain metallurgical uses of coke).

a. Weight of coke (of a given size) per cu. ft. increases with increase in apparent specific gravity.

b. Same as above in the case of true specific gravity.

c. Same as above with decrease in porosity.

d. The percentage of water absorbed by coke decreases with decrease in porosity.

e. The percentage of water absorbed by coke generally decreases with the increase in weight of coke (of a given size) per cu. ft.

On this question, I think that it would be well for all members of this Association to throw in their lot in the hope of establishing "Indices of Coke Comparison," thus eliminating many of the uncertainties contingent on the usual methods employed in comparing one coke with another. For example, the following formulae are suggested as useful in gauging the weighted merit of one with another domestic coke:

Index of Sized Coke Yield $= I$

$$= D_1 \times D_2 \times Y$$

Index of Coke Value $= II$

$$= I \times \frac{F}{P} \times \frac{T}{2500 \times a}$$

Index of Coke Price $= III$

$$= II \times \frac{S}{W}$$

Index of Consumer's Value $= IV$

$$= \frac{D_2}{S} \times \frac{F}{P} \times \frac{T}{2500 \times a}$$

$D_1 =$ 100 per cent coke minus the percentages of undersizes that are too small to be used in shatter test.

$D_2 =$ Per cent weighted shatter test.

$Y =$ Percentage dry coke yield minus percentage volatile matter in coke.

$F =$ Percentage Fixed Carbon in coke.

P = Percentage Porosity.

T = Fusion temperature of coke ash, degrees Fahrenheit.

a = Constant,—arbitrarily assumed equal to two (2).

S = Selling price of coke, dollars per net ton, f.o.b. plant.

W = Cost of coal, dollars per net ton, f.o.b. plant.

By drawing attention thereto, I wish to emphasize that these indices discount high volatile matter in domestic coke.

These indices do not recognize the factors of cell wall thickness and character, nor number or size of cells for a given porosity, for the simple reason that insufficient data is now available to me to allow of their being used cojointly with other factors. However, it appears that for two domestic cokes of equal porosity, the one having larger cells with thick walls is preferable to that having thinner walls enclosing a greater number of cells.

I realize that much improvement is called for in these formulae,—they are merely offered to stimulate thought along such lines. Furthermore, it is not reasonable to suppose that the several factors constituting these formulae should be given equal weight as has been done; yet, on a number of occasions I have been surprised to find how well they checked with practical results, especially their concordance with the important token of consumer's complaints.

The reason for selecting domestic coke for these comparisons is intentional, because most coke distributed from gas plants is sold as domestic grades. Moreover, no class of coke appears to be more in dispute than this, less known concerning it, nor has attached to it less stringent and yet more flexible specifications; whereas, it is the crux of the entire coke problem in most gas plants because the potential domestic coke market probably offers greater financial and economic opportunities than are available in other directions.

I dare say that most of our members have personally worked up financial statements for their respective plants, or at least have seen such records. Of these I desire to ask the question, "Does, or does not, coke return to the plant the greatest revenue of any one product?" If it does, why, as commonly practiced, is coke given such little consideration; especially so when each succeeding year brings about a more depleted supply of good coking coal, which thus further increases the difficulties and complexity of the coal problem?

Not necessarily from an economic point of view alone is it a fallacy to show such disinterest in the matter of the manufacture of high grade coke; there is equally as strong a technical appeal.

Selection of Coal—" Ideal Mixture"

In summing up the several more important factors that should be considered in selecting a coal mixture, it is apparent that, largely from a technical point of view, chief consideration should be given to:

a. Ash content.

b. Sulphur content.

c. Coking quality.

d. Ability of plant equipment to properly proportion the percentages of the several coals constituting the mixture and thereafter properly mixing them, to the end that the mixture be maintained with unerring constancy.

e. Coal mixture that readily lends itself to carbonization by means of the peculiar characteristics of the local carbonizing unit.

f. Coal that will give desirable yield of coke per thousand feet of saleable gas.

g. Finally, the selection of a coal mixture that permits of the production of coke, the characteristics of which are best suited to meet local requirements,—not necessarily demands.

In making these statements, it is presupposed that one considers only coal mixtures that yield gas and by-products of desired quality and quantity. Such a prepared coal mixture as these specifications call for can best be had by the selection of a *single* coal of intermediate volatile matter, rather than a number of coals requiring individual selection and proportioning as steps in attaining the most gratifying results. In short, I think that the "one coal mixture" is the desideratum in the matter of selecting and preparing a coal charge.

This latter recommendation fails, however, to be of general practical value for the reason that there is not enough available coal of such description as to meet the demands of the coke and gas industries, outside of the freight rate question. Nevertheless, there does appear to be more available than is used in such plants as it can be economically used, and where it can be best employed. The many advantages attending the adoption of such a coal charge do not seem to be very generally recognized.

Coke Quenching

Coke quenching should be carried out so that a minimum of degradation results; also, so that the coke will thereafter not contain moisture above trade (consumers') demands. These results may be had by rapidly quenching with a small amount of water and this necessitates a uniform coke distribution throughout the quenching car, as well as a proper design of spray pipes. The proper quenching of coke is also influenced by the imbibition of the coke. The quantity of moisture absorbed decreases with a greater use of low volatile coal in the mixture, with a decrease in the oxygen content of the original coal, and with over-coking.

Coke Handling

Coke should be screened and handled with as few operations as possible since each screening or handling reduces the yield of sized coke and increases that of braize. Conversely, there should be sufficient sizing-screenings and re-screenings to maintain a uniformly sized and clean coke production at all times. It is just as important, if not more so, that this practice be followed with the smaller, as with the larger sizes of coke.

In conclusion, I wish to state that this paper will have thoroughly satisfied my expectations if it accomplishes no more than to awaken a wider interest among members of the coke and gas fraternity in the principles underlying the selection and carbonization of coal.

The man with a new idea is a Crank until the idea succeeds.

—Mark Twain

Employment Bureau

SERVICES REQUIRED

Wanted by a gas and electric company, young man to do office work who has had experience in ledger work, general routine work, and especially on the complaint or service desk. In reply, please give outline of experience, references and salary expected. Address:
Key No. 022.

WATER HEATER SALESMAN WANTED—A large gas company needs several good water heater salesmen to work on commission basis in Western Pennsylvania. Exceptionally good territory.
Key No. 026.

WANTED—Two experienced salesmen, to specialize on the sale of gas boilers for house heating and industrial uses, by a gas company desirous of increasing its present gas boiler load. Give details of experience and results obtained.—Address A. G. A.
Key No. 039.

APPLIANCE SALESMEN—Calling on Gas Companies to sell tank water heaters as a side line on commission basis. State territory, references and experience. Address A. G. A.
Key No. 042.

WANTED—Gas main laying foreman for gas company in vicinity of New York. Address A. G. A.
Key No. 044.

WANTED—A Gas Company desires the services of a technically trained man, having had experience in main and service work; college graduate preferred. Address A. G. A.
Key. No. 045.

SERVICES OFFERED

WANTED—Position of responsibility as Manager or Industrial Fuel Engineer—18 years' varied experience in the gas business. References and service record furnished. Address A. G. A.
Key No. 142.

WANTED—Am open for position as general superintendent, engineer or manager of fair sized property. Fifteen years' experience in combination coal and water gas plants. Experience covers vertical and horizontal coal gas installations, also distribution work. At present am managing plant of five million sendout and have been acting in capacity of assistant engineer. Can furnish excellent credentials from present and past employers. Married. Can report with reasonable notice. Address A. G. A. Monthly.
Key No. 164.

ENG.-SUPT. of one of the largest gas plants in the country would consider change. Desires to locate with company in which opportunities for future advancement are better than in present position. Is a married man. Has technical University training. No particular preference as to location. Address A. G. A.
Key No. 159.

AVAILABLE—Man of executive ability, experienced in all phases of the gas business and sales and advertising work, including agency work on National accounts. Capable of creating, planning and following through all forms of advertising. Prefer locating in West or South Atlantic states. Minimum salary of $4,000. Address A. G. A.
Key No. 167.

WANTED—Superintendent of Distribution seeks similar position high or low pressure. 14 years' experience covering all branches of the work, office, field, and shops. Speaks and writes Spanish. Southern part of U. S. or Latin America preferred but not essential. Address A. G. A.
Key No. 169.

AM OPEN FOR A POSITION of greater responsibility. At present, manager of gas company with over 5,000 meters. Technical training, started in as cadet engineer with one of largest operating companies in U. S. Have eleven years' experience in engineering, construction, distribution and manufacturing, and over four years in commercial, new business and financial as manager. Prefer manager's position in good sized city. Age 40 years and married. Address A. G. A.
Key No. 170.

GAS ENGINEER—Eighteen years' experience in design, construction and operation of gas plants, all departments, manufacture and distribution, also electrical experience in combination plants desires position of responsibility with progressive company. Past six years chief engineer with large gas company. Address A. G. A.
Key No. 171.

EXECUTIVE, with fifteen years' experience in coke oven practice on plants manufacturing surplus gas for city consumption, desires connection with growing public utility either as executive or position leading to same. College graduate, good personality, married. Available on reasonable notice. Address A. G. A.
Key No. 172.

GAS ENGINEER—18 years' experience with 3 largest gas companies in the country, am open for engagement as gas engineer, general superintendent, manager or sales engineer. Excellent references. Address A. G. A.
Key No. 173.

ENGINEER—Twenty-one years' experience in Gas and Electric production and distribution, wishes an opening with a larger gas company or a combination gas and electric company. Eleven years with the United Gas Improvement Co. Highest reference from present connection. Address A. G. A.
Key No. 174.

WANTED—A position as General Manager or Engineer of Gas Property. Have had experience and can produce results in either large or small properties. Can give exceptional references on past record. Address A. G. A.
Key No. 175.

GAS ENGINEER, 40, with thorough training (16 years) in the gas business and real executive ability, wishes to connect up with a live concern in any capacity where technical and commercial ability will count. At present engaged but could be available on two months' notice. Address A. G. A.
Key No. 176.

WANTED—Executive position by young man with eighteen years' (18) experience in all branches of gas business. Eight years (8) as manager. Past four years, vice-president and general manager of gas company with nearly 10,000 meters. Mechanical engineer. Expect to voluntarily place myself on the market about August 15, 1924. Will accept position as manager of company with 7,000 to 10,000 meters, or assistant manager and engineer, with larger company. Married man. Replies must be strictly confidential. Address A. G. A.
Key No. 177.

WANTED—Position as superintendent of small gas company or combination gas and electric company, or as assistant to superintendent or manager of a large plant. Technical university training. Five years' experience in maintenance and operation of steam, gas and electric plants. Address: A. G. A.
Key No. 178.

WANTED—Am open for position as appliance salesman with Gas Company or Appliance Manufacturer. Have had twelve years' experience selling ranges, water heaters, room heaters and illuminating devices. Am at present employed in this capacity by a large corporation, but desire to make a change. Can furnish references from present and past employers. Married. Can report on reasonable notice. Address A. G. A.
Key No. 179.

WANTED—Am open for a position as a salesman for a gas appliance manufacturer or as manager of a gas appliance department with a gas operating company, eighteen years' experience with mechanical and technical training. Married. Can furnish A1 references. Address A. G. A.
Key No. 180.

COKE PLANT EXECUTIVE seeks new connection. Over eight years' experience, Koppers and Solvay ovens with complete by-product recovery. University graduate, thirty-four years old, married, with one child. Fitted for Assistant Superintendent or Assistant to Manager of any coke or gas industry. Will locate anywhere. Address A. G. A.
Key No. 181.

EXPERIENCED gas works engineer, with by-product coke oven experience; also familiar with water gas and retort operation; desires to connect with gas works in responsible position. Address A. G. A.
Key No. 182.

ENGINEER STATISTICIAN—10 years' experience in the valuation and operation of mines, industrial plants, and public utilities in connection with the maintenance, statistical, legal and accounting phases of business, now seeks permanent engagement with reputable firm. Address A. G. A.
Key No. 183

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